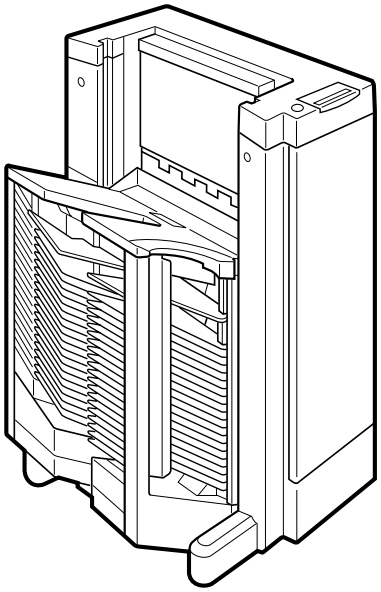
SHARP **SERVICE MANUAL**

CODE : 00ZSFS55NSM1J



20-BIN STAPLE SORTER

MODEL SF–S55N

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Be sure to use only the genuine parts so as to ensure safety and reliability.

The parts marked with ⚠ are important for safety. When replacing these parts, be sure to use the specified parts so as to keep safety and performance of the machine.

SHARP CORPORATION

[1] SPECIFICATION

1. Operation specification

(1) Type

- 20-bin staple sorter
- Stacking system
- Face-up stacking, sequential opening in order of bin transfer by lead cam
- To-and-fro sorting (when RADF is used)
- Stacking paper
- 64 to 200 g/m^2 paper
- Stacking paper sizeA5/8-1/2" x 5-1/2" to A3/11" x 17"
- Number of bins
  20 bins + Non-sort tray

(2) Modes

a. Stacking mode

1) NON-SORT MODE : Unless SORT, GROUP or STAPLE mode has been set, all the prints are unloaded to the non-sort tray.

2) SORT MODE : Gathering of prints is performed automatically.

3) STAPLE SORT MODE : After completion of SORT mode the stapling is performed automatically.

4) GROUP MODE : The prints of one original are unloaded to the same bin.

b. Staple mode

1) AUTO STAPLE MODE : Full-automatic stapling in the STAPLE SORT mode

2) MANUAL STAPLE MODE : Stapling initiated by turning on the STAPLE key after completion of SORT mode

3) HAND-INSERTED STAPLING :
Simple stapling initiated by turning on the STAPLE key after loading paper in the uppermost bin

c. Sort order

1) Original stand copy : Once to-and-fro sort (always return to the 1st bin)

2) Using RADF : To-and-fro sort

(3) Stacking volume

Paper size	Sort	Group	Non-sort
A3/11"×17" B4／8 1/2"×14"	25	25	250
A4 portrait/8 1/2" x 11" portrait B5 portrait	50		
A4/8 1/2"×11" B5/A5 8 1/2"×5 1/2"		30	

Note : The stacking volume of STAPLE SORT conforms to the stacking volume of SORT. However, STAPLE SORT is disabled for paper having a width less than 210 mm or a length less than 182 mm.

Note : Up to 10 sheets of special paper can be stacked for NON-SORT.

※Special papers: Mother print paper, OHP paper, thick paper (81 to 200 g/m^2)
However, front covers and back covers and interleaving papers which are thick papers can be sorted.

(4) Stacking volume overflow

1) NONSORT : BOOK mode.

2) SORT : When 26 sheets of large size paper or 51 sheets of small size paper are loaded in the BOOK mode even when DF is used, the sorter OVERFLOW signal is output. (Remove paper, and press the COPY button to re-start.)

3) GROUP : Regulation by the print quantity at the main unit side (inhibition item setting)

(5) Bin number OVERFLOW

SORT/GROUP mode Paper size A4, 8 1/2" x 11", B5

1) Front side taking-out ON
: Suspension after completion of processing of set quantity for 40 bins (for all sizes)
Automatic start after removal of paper

2) Front side taking-out OFF
: Suspension after completion of processing of set quantity for 20 bins (for all sizes)
Re-start is enabled after removal of paper.

Other sizes
: Suspension after completion of processing of set quantity for 20 bins (for all sizes)
Re-start is enabled after removal of paper

(6) Total stapling time (20 bins)
1) Single stapling: Approx. 27 seconds (inch. pre-stapling adjusting time, approx. 4 seconds)
2) Double stapling: Approx. 52 seconds (incl. pre-stapling adjusting and stapler shift time approx. 5 sec.)

(7) Bin return time (20 to 1 bin home position)
Approx. 11.5 sec (book copy state, multi-load 2nd copy) Approx. 16 sec (others)

(8) Paper detection: Provided

(9) Limit-less sort: Possible

(10) In-bin sort (multi-load)
Up to 2 copies in the lateral feed mode (A4, B5, 8 1/2" x 11")
However, paper size on all bins must be the same, and the total quantity of paper sheets in each bin must not exceed 50.

(11) Front side taking-off
In the lateral feed mode (A4, B5, 8 1/2" x 11") only

(12) Control panel
Manual stapling button, Front access button, Bin-up/Bin-down button, Staple position selecting button
Display
Manual stapling: Enable/Disable (Enable while LED is lighting)
Display on main unit control panel: Nonexistence of staples, indication of staple position

(13) Operating sound
60 db or less

(14) Stapling section
1) Stapling direction
2) Rotating cam driving-in system
3) Maximum stapling thickness: Bundle thickness 5.5 mm or less
80 g/m^2 paper 48 sheets + 200 g/m^2 paper 2 sheets

(15) Staple charging system
Exclusive-use staple cartridge system (5,000 staples)

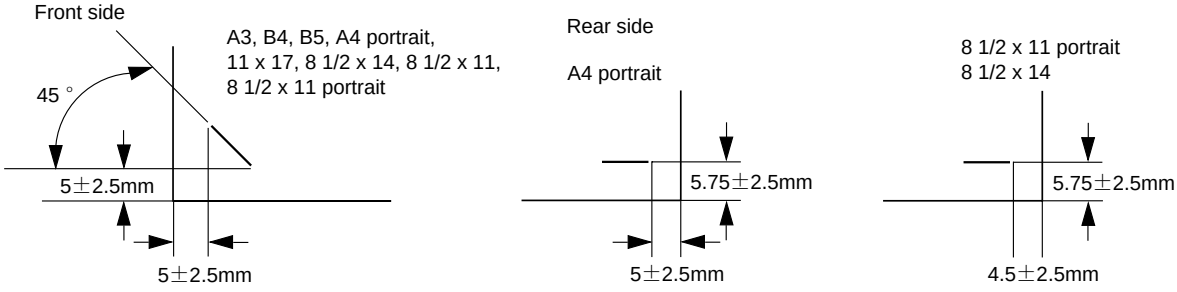
(16) Detection of nonexistence of staple: Provided

(17) Stapling-enable size
A3, A4, B4, B5, A4 portrait, 11" x 17",
8 1/2" x 14", 8 1/2" x 11", 8 1/2" x 11" portrait

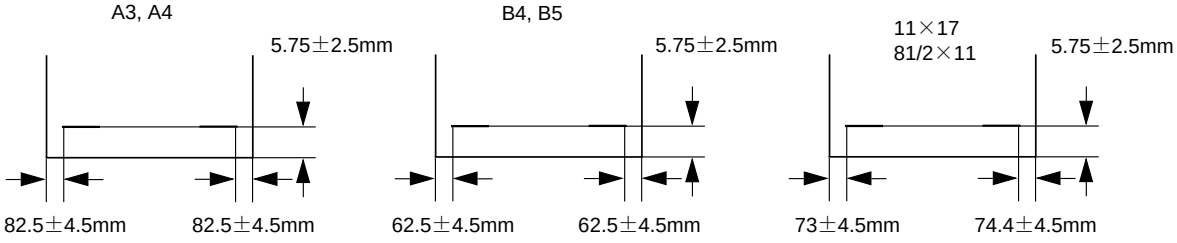
(18) Manual stapling
Possible (however, one innermost part cannot be stapled)

(19) Staple specification
Automatic and manual

(20) Stapling position (single stapling)



Stapling position (double stapling)



Type of paper		Size	Sorter mode		
			NON-SORT	(STAPLE) SORT	GROUP
Plain pape	Paper for PPC 64 to 80 g/m²	A3, B4, A4, B5, A5Note	○	○	○
		11"×17", 8 1/2"×14" 8 1/2"×11", 8 1/2"×5 1/2"	○	○	○
	Recycled paper for PPC	A3, B4, A4, B5	○	○	○
	Color paper for PPC	B4, A4	○	○	○
Special paper	Mother print paper	A3, B4, A4, B5	○		
	Paper for OHP	A4, 8 1/2"×11"	○		
	Government-printed postcard	A6 portrait	○		
	Thick paper 81 to 200 g/m²	A3 ,B4, A4, B5 8 1/2"×11"	○	△	
	Label paper	A4	○		

Note: Paper having a width less than 210 mm or a length less than 182 mm cannot be stapled.

2. Electric specification

1) Input voltage: DC 24V
2) Maximum power consumption: 100W or less
3) GS (EN60950)
4) VCCI Class 1, FFC/IC Class A
5) CE (EN55022, EN50082, EN60950)

3. Overall size and weight

1) 591W x 609D x 960H mm
2) Approx. 56 kg

4. Environment specification

Environment ensuring normal operation

10˚C to 32.5˚C
15% to 85%RH
0.7 to 1.0 atm (corresponding to altitude 3,000 to 0 m)

Storage and transportation environment
Any defects must not appear during storing for 10 days in packaged state in the following environmental conditions.

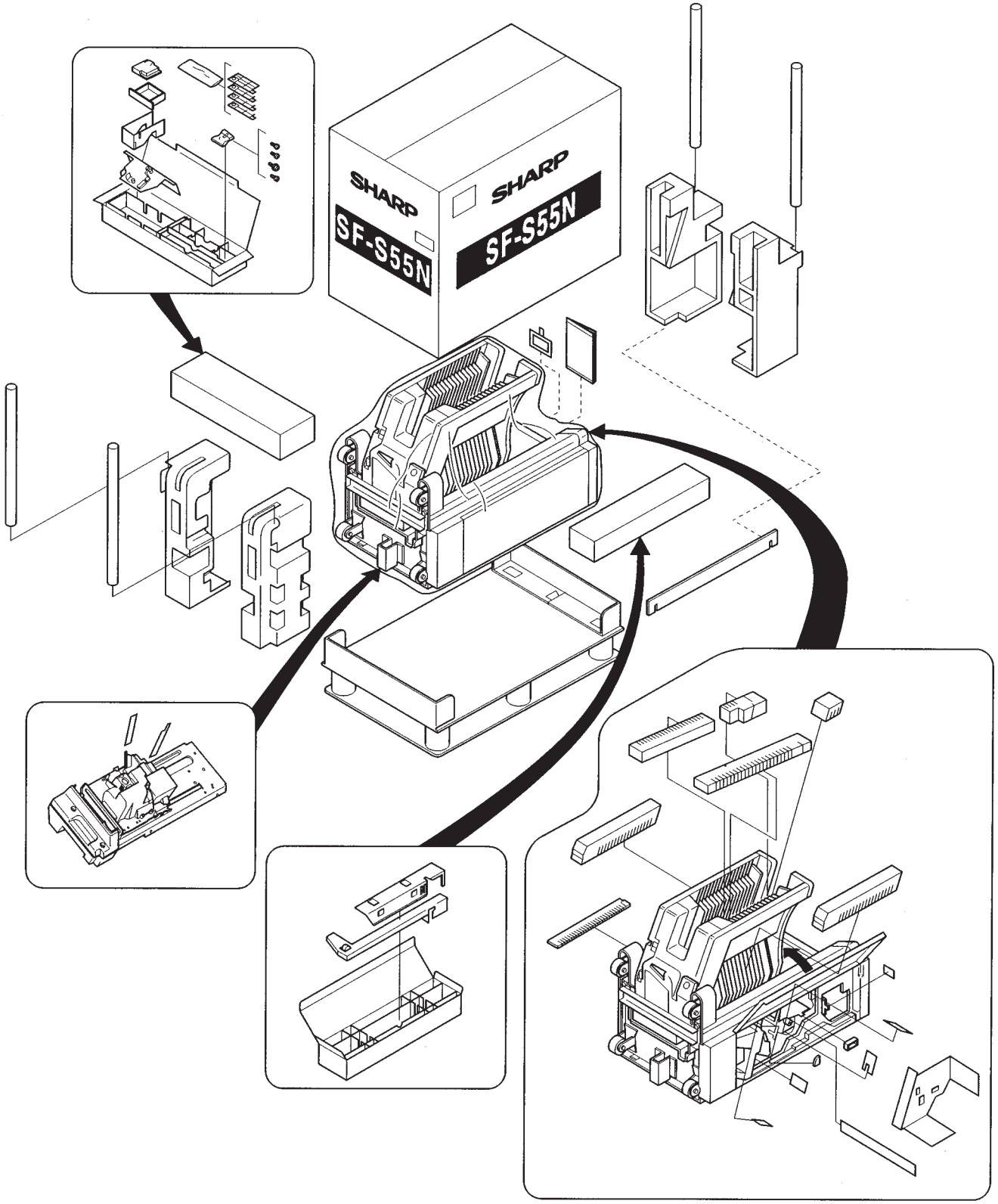
-20˚C, 240 hours
40˚C, 90%, 240 hours

5. Others

Expendables
Staple SF-SC11

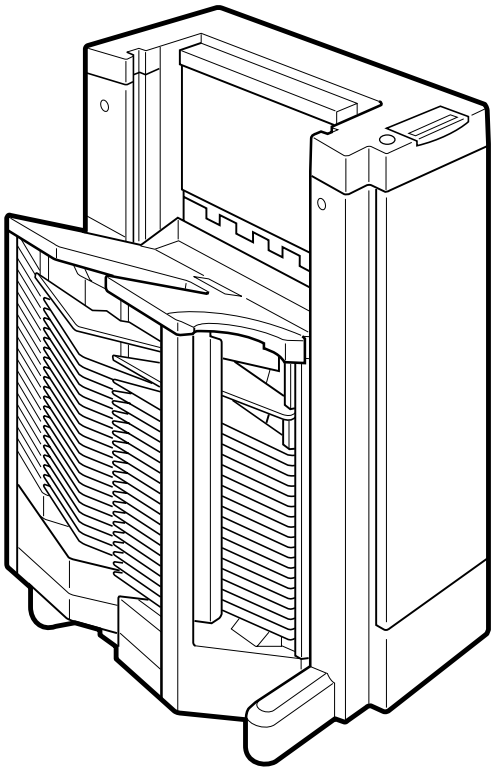
[2] Unpacking and installation

1. Unpacking



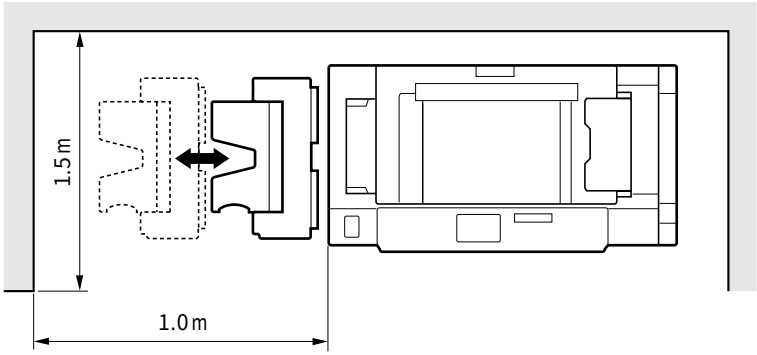
[2] Installation

1. Parts list



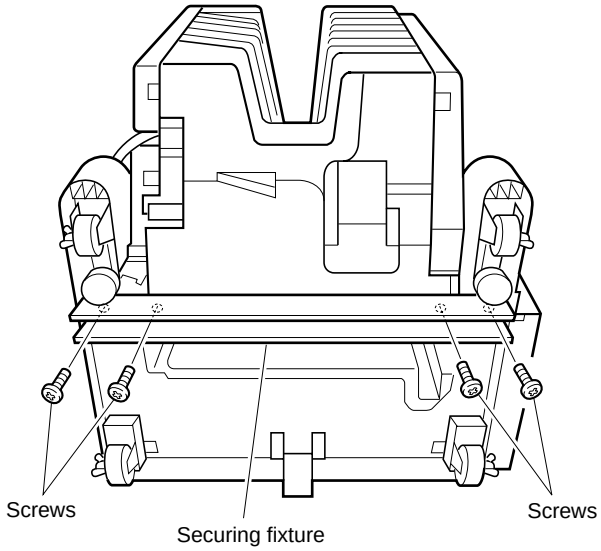
Before installation.....

Be sure that you have plenty of room around the copier for work space.
Install the copier on a flat floor.



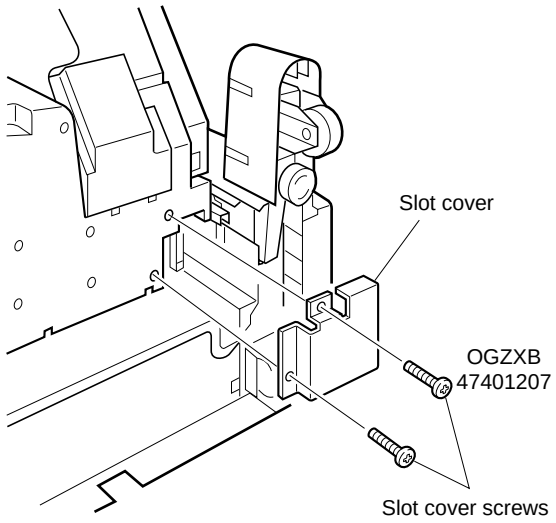
Remove the securing fixtures.

Remove the 4 screws fixing the securing fixtures at the bottom of the sorter, and remove the securing fixtures.



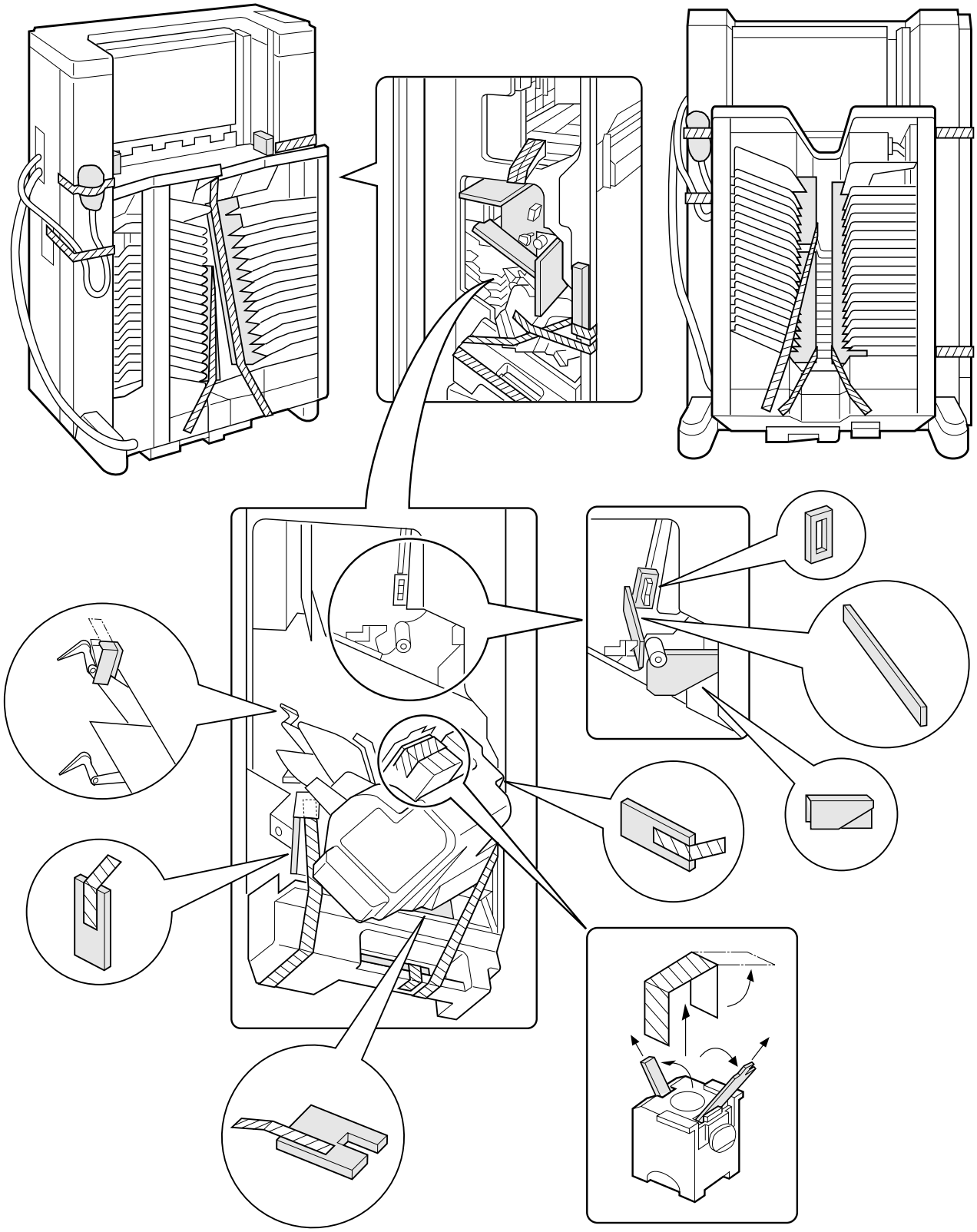
Fit the slot cover.

Fit the slot cover to the bottom of the sorter in the position shown in the figure, and secure it with the 2 slot cover screws (M4x12).

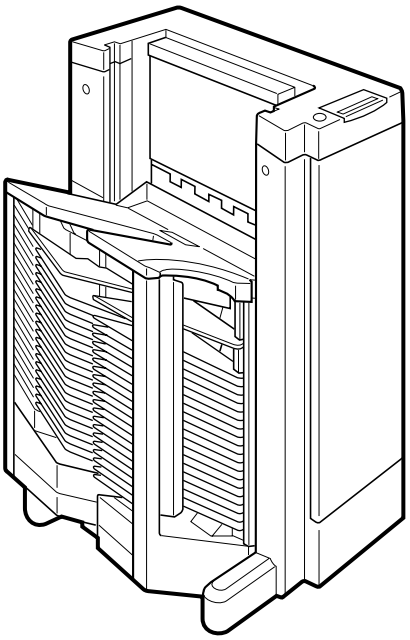


2. Unpacking

Remove all the securing tape and securing materials.

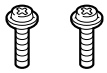


FOR USE WITH COPIER MODEL SF-2052



Parts to be used

Rail mounting plate screws
(M4 x 14): 2
OGZXB27401407

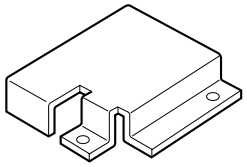


Rail screws A
(M4 x 10): 2
OGZXB67401006

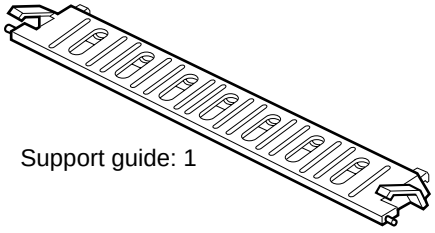
Rail screw B
(M4 x 10): 1
OGZXB27401006

Sorter mounting plate screws
(M4 x 16): 2
OGZAA12311000

Slot cover screws
(M4 x 12): 2
OGZXB47401207



Slot cover: 1



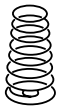
Support guide: 1

Used only in 200 V areas and agent areas (CE)

(A)

(B)

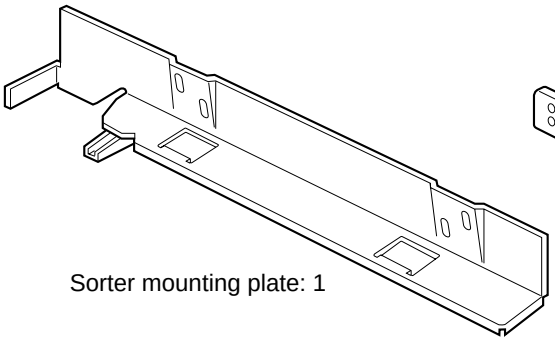
Grounding spring screw
(M4 x 8)



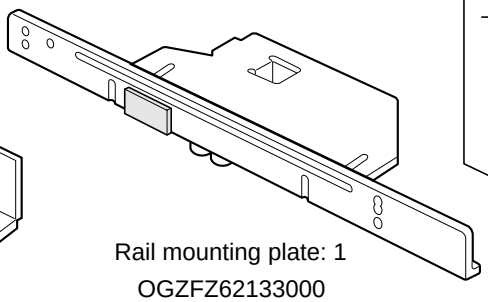
(A)

(B)

Grounding spring

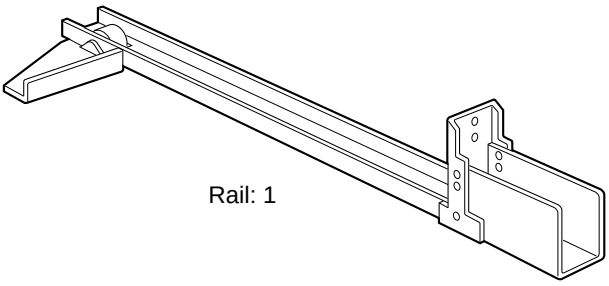


Sorter mounting plate: 1

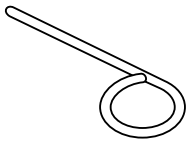


Rail mounting plate: 1
OGZFZ62133000

OGZFE02132000

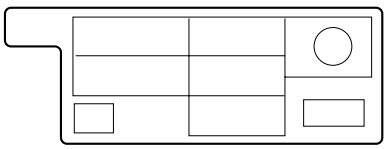


Rail: 1

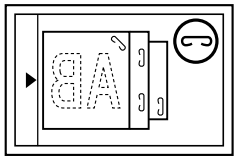


Stapler jam release tool: 1

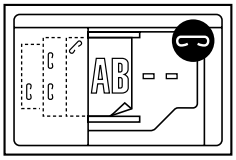
Stuck to the lower part of the front cover



Operation instruction label



Stapling location label
(for copier): 1

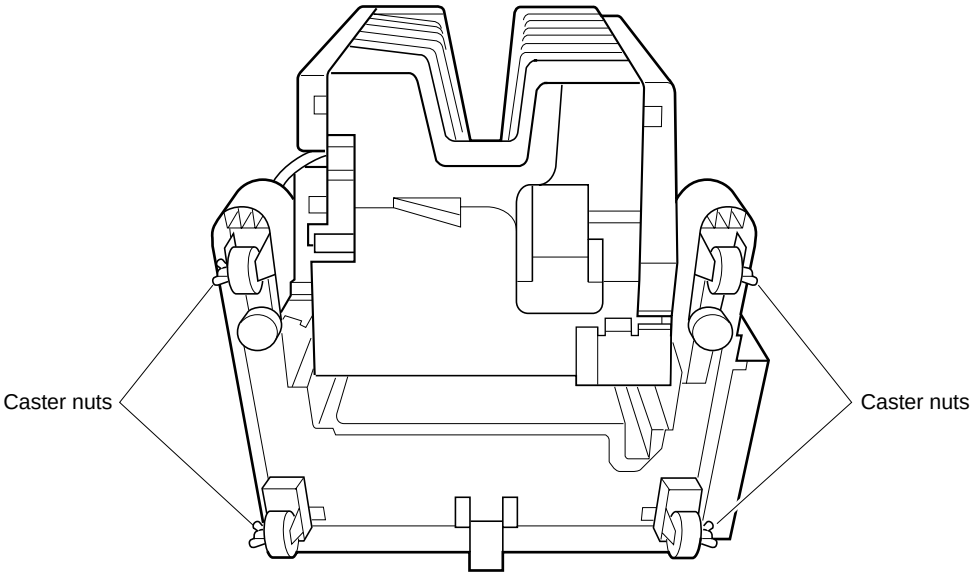


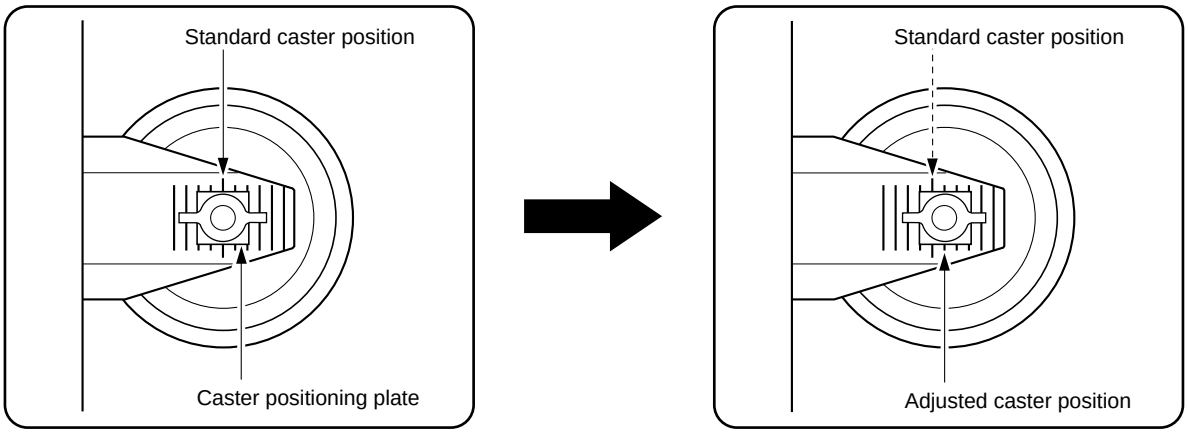
Stapling location label
(for RADF): 1

4. Installation (mounting)

Adjust the position of the casters.

• Loosen the caster nuts (4) and shift the caster positioning plates one notch, as shown in the illustration.





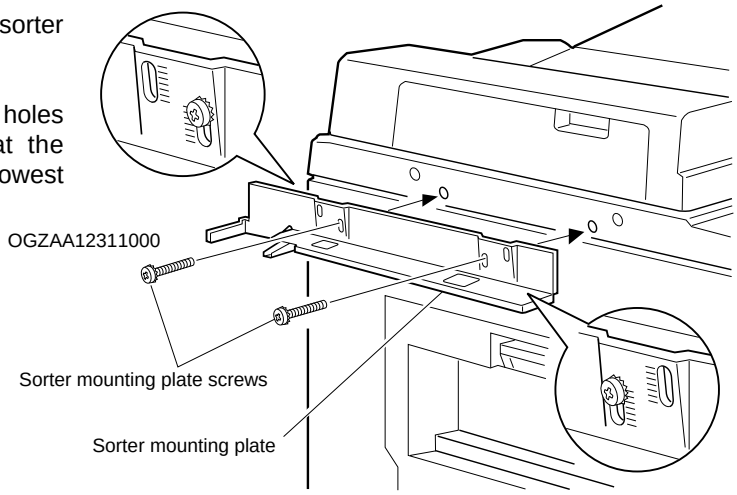
Unplug the copier's power cord before carrying out the following procedure.

Mounting of the staple sorter onto the copier.

1. Attach the sorter mounting plate.

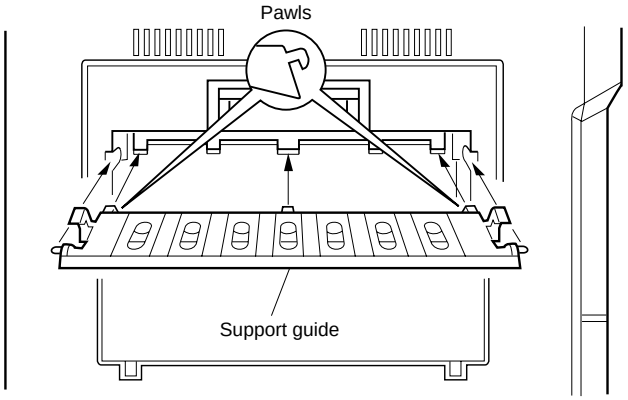
Attach the sorter mounting plate with the 2 sorter mounting plate screws (M4x16 with washer).

At this time, the sorter mounting plate screw holes are elongated; tighten the screws so that the sorter mounting plate hangs down in its lowest position, in the way shown in the figure.



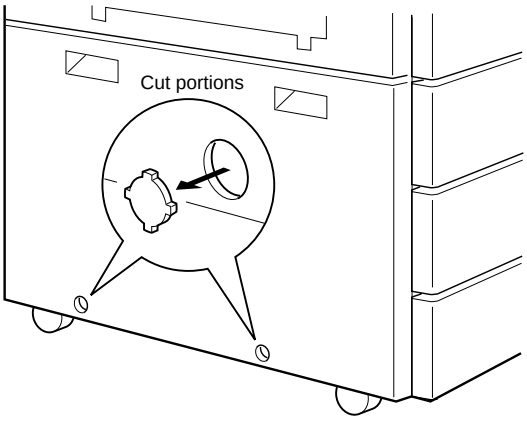
2. Attach the support guide.

Attach the support guide by attaching its pawls (2 locations) to the inside of the copier's paper output section.



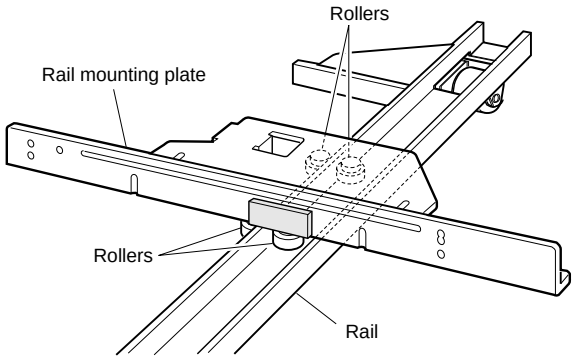
3. Cut off the cut portions of the copier.

Remove the 2 cut portions from the lower part of the copier's left cabinet panel.



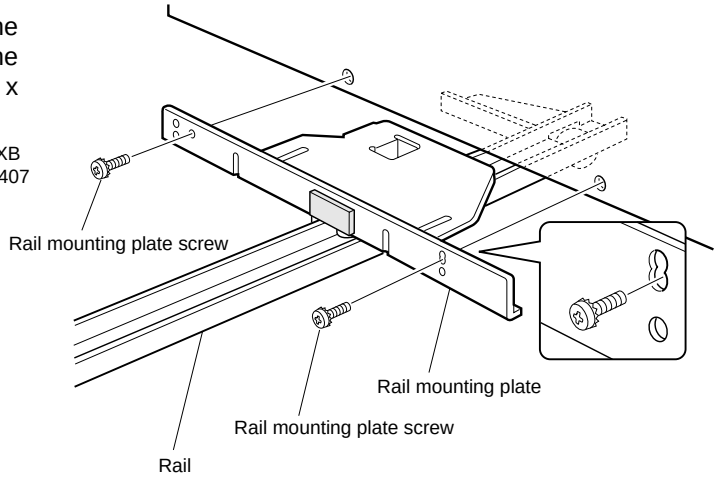
4. Fit the rail mounting plate onto the rail.

Insert the rail between the rollers on the rail mounting plate as shown in the figure.



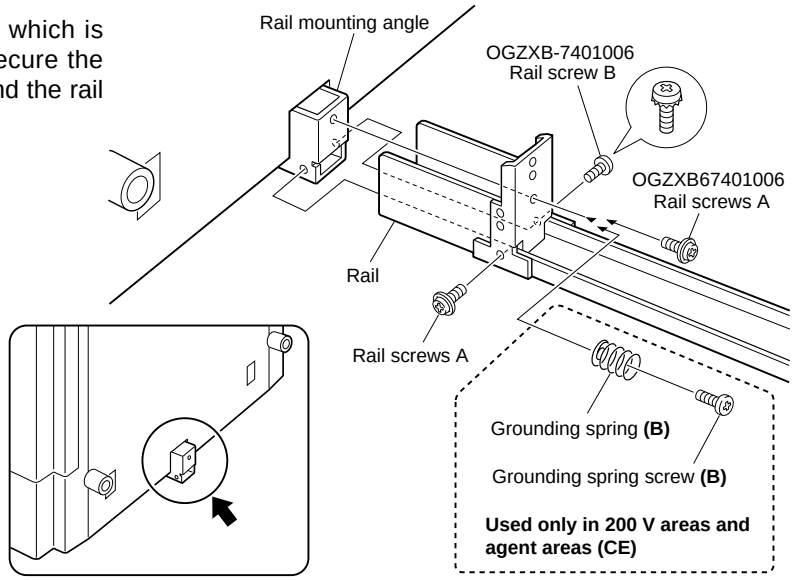
5. Attach the rail mounting plate to the copier.

Insert the rail under the copier as shown in the figure and secure the rail mounting plate to the copier with two rail mounting plate screws (M4 x 14).



6. Attach the rail to the sorter.

Fit the rail onto the rail mounting angle which is fitted at the bottom of the sorter, and secure the rail with the two rail screws A (M4x10) and the rail screw B (M4x10).



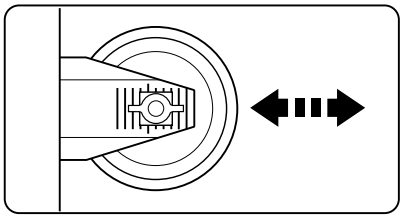
7. Confirm that the staple sorter can be attached and detached correctly.

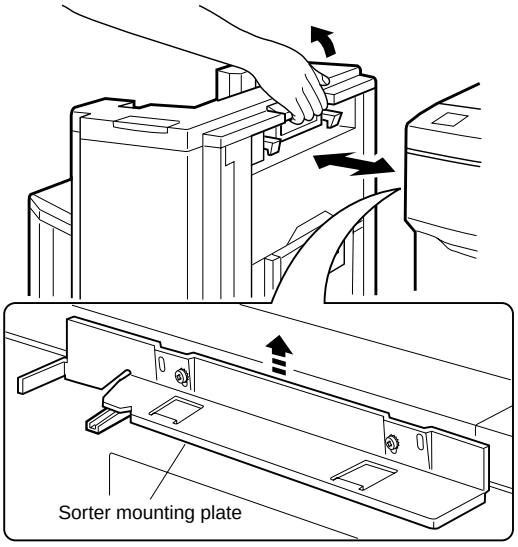
(1) Latch and unlatch the staple sorter from the copier to confirm that it moves smoothly.

(2) Confirm that the staple sorter locks into place beside the copier.

If not, adjust the height of the sorter mounting plate until the staple sorter locks securely into place.

• If the above operation fails to make the staple sorter lock into place, the floor is probably not level.
Alter the positions of the casters on the bottom of the sorter to adjust levelness.

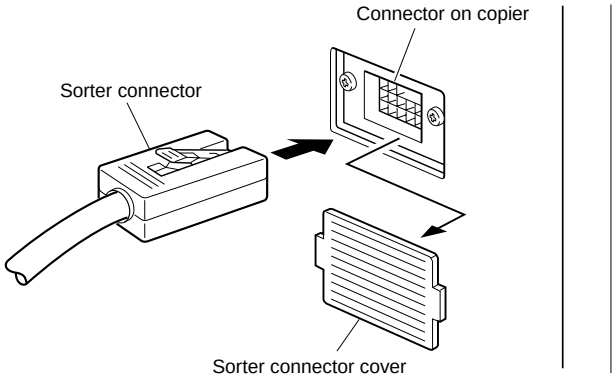




8. Connect the sorter connector.

Remove the sorter connector cover from the copier's rear panel.

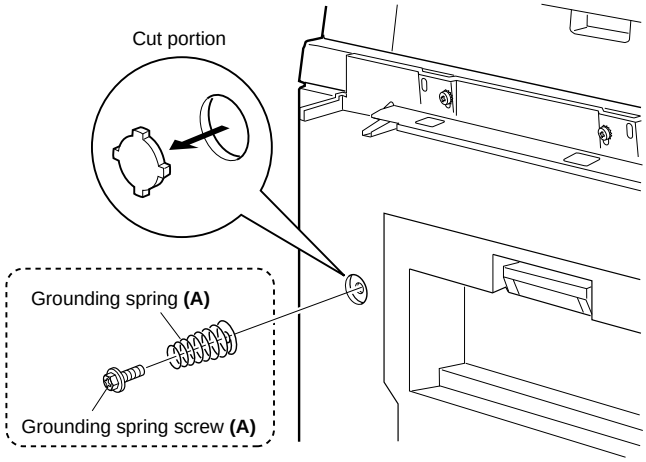
Then connect the sorter connector to the connector



9. Attach the grounding spring. (only in 200 V areas and agent areas [CE])

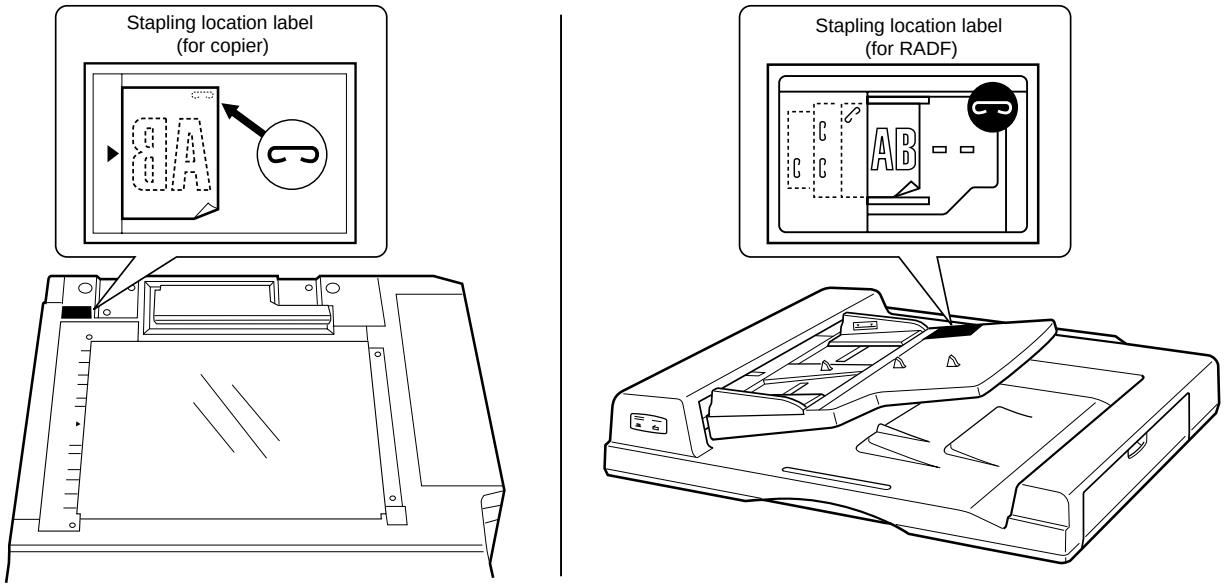
Cut off the cut portion (1 location) from the upper part of the copier's left cabinet panel.

Then secure the grounding spring included in the package using the grounding spring screw (M4 x 8).



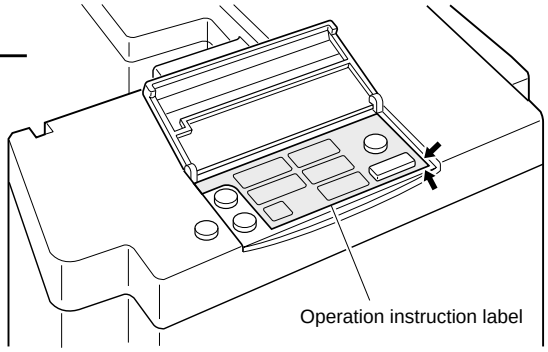
10. Affix the stapling location labels.

Affix the stapling location labels as shown in the figure.



11. Affix the label to the operation unit.

Align the right and bottom edges of the operation instruction label with the control unit's ribs, and stick the label on in that position.



Insert the copier's power plug into a grounded outlet, and turn the power switch on. Then, follow the procedure below.

12. Set the mode

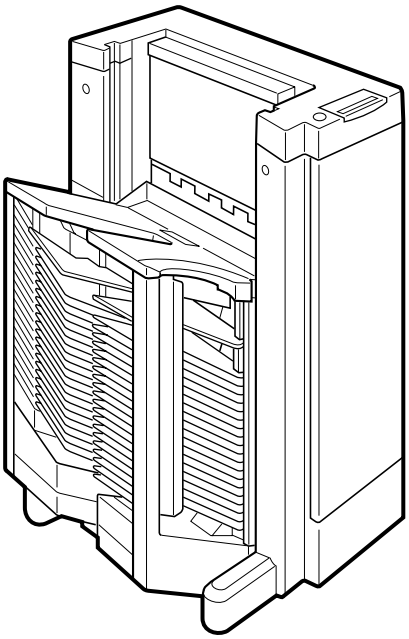
・Perform the following key operations on the copier to set the mode.

C → ↵ → 0/◊ → ↵ → 2 → 6 → [ ] → 0/◊ → 1 → [ ]

Select an adequate number from the display of the operation panel using the 10-key pad. → [ ] to set the mode.

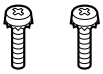
When this procedure is complete, see page 14, "Operation Check of Staple Sorter."

FOR USE WITH COPIER MODEL SD-2260/SD-2275



Parts to be used

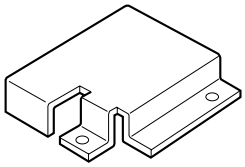
Rail screws A
(M4 x 10): 3



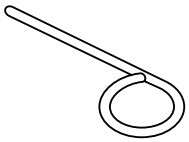
Rail screws B
(M4 x 10): 2

Slot cover screws
(M4 x 12): 2

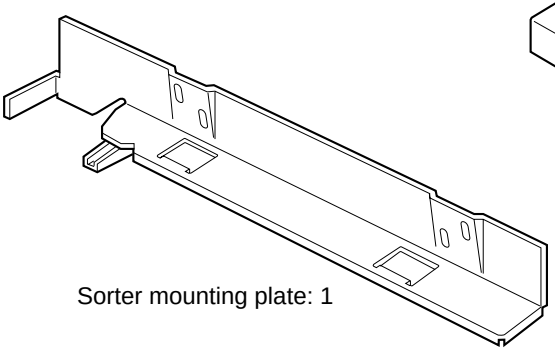
Sorter mounting plate screws
(M4 x 16): 2



Slot cover: 1

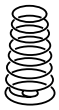


Stapler jam release tool: 1
Stuck to the lower part of the front cover



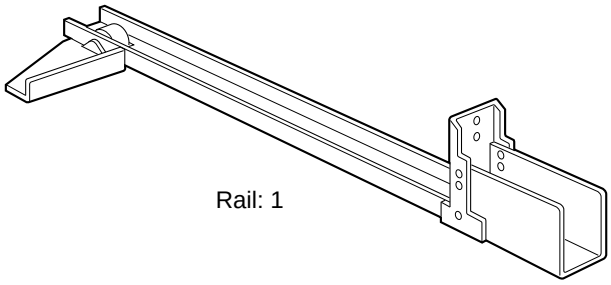
Sorter mounting plate: 1

Used only in 200 V areas and agent areas (CE)

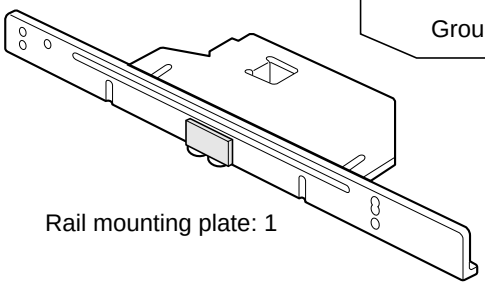


(A)

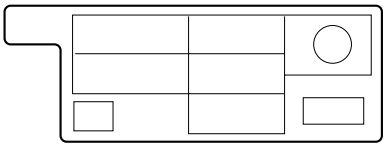
Grounding spring



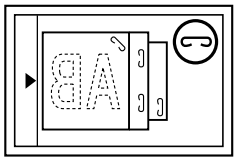
Rail: 1



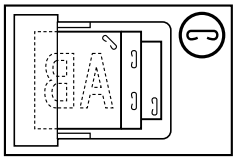
Rail mounting plate: 1



Operation instruction label



Stapling location label
(for copier): 1



Stapling location label
(for RADF): 1

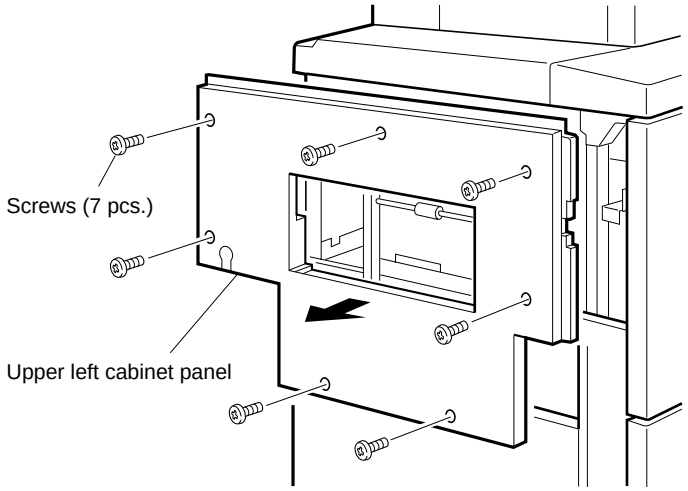
6. Staple setting

Remove the copier's power plug from its socket before carrying out the following procedure.

Mounting the staple sorter onto the copier

1. Remove the upper left cabinet panel from the copier.

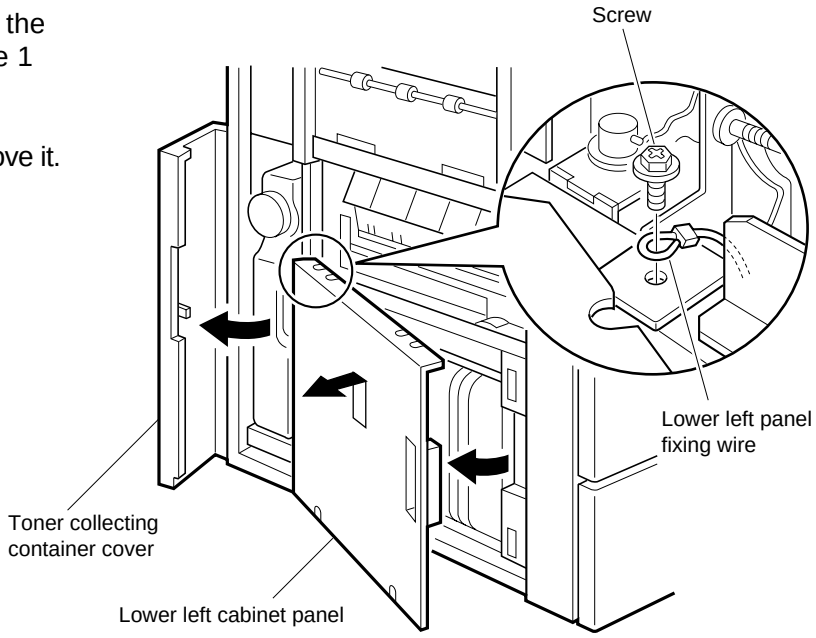
Remove the 7 screws securing the upper left cabinet panel to the copier, and take off the upper left cabinet panel.



2. Remove the lower left cabinet panel from the copier.

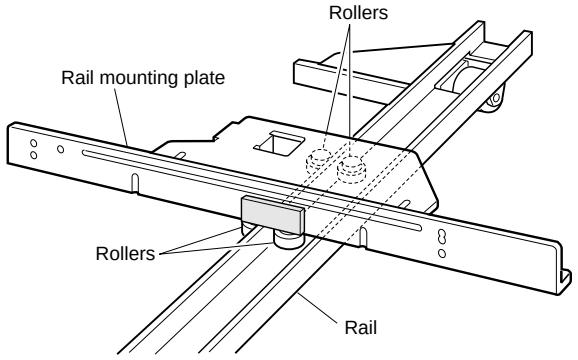
Open the toner collecting container cover and the lower left cabinet panel and then remove the 1 screw for the lower left panel fixing wire.

Next, pull up the lower left cabinet panel to remove it.



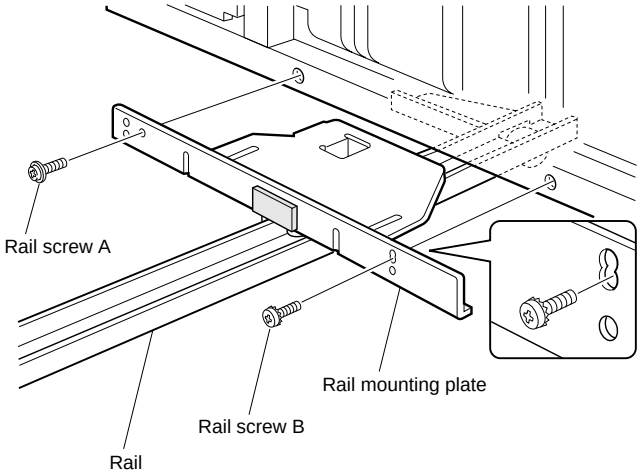
3. Fit the rail mounting plate onto the rail.

Insert the rail between the rollers on the railmounting plate as shown in the figure.



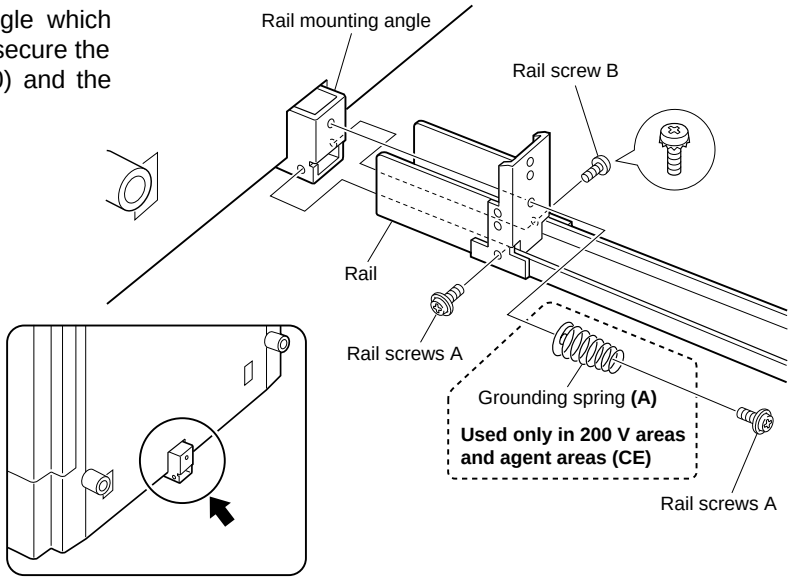
4. Attach the rail mounting plate to the copier.

Insert the rail under the copier as shown in the figure and secure the rail mounting plate to the copier with one rail screw A and one rail screw B (M4 x 10 each).



5. Attach the rail to the sorter.

Fit the rail onto the rail mounting angle which isfitted at the bottom of the sorter, and secure the rail with the two rail screws A (M4x10) and the rail screw B (M4x10).



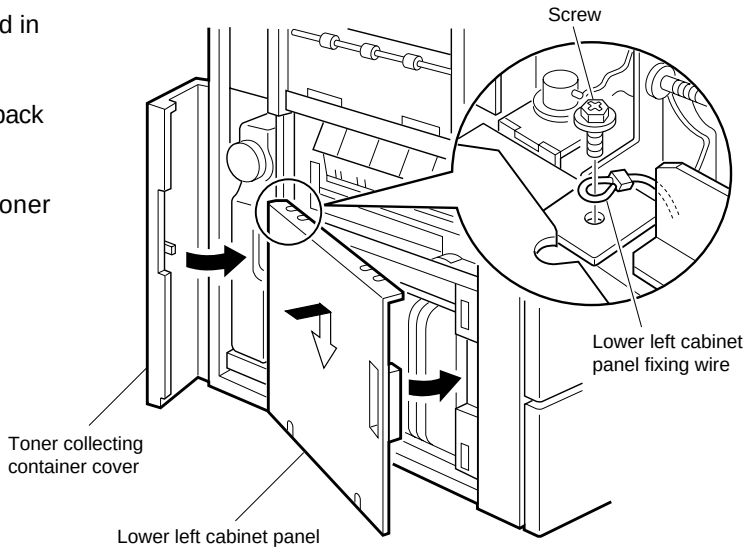
7. Removing the jammed staple

6. Reattach the lower left cabinet panel.

Reattach the lower left cabinet panel removed in step (3) in its original position.

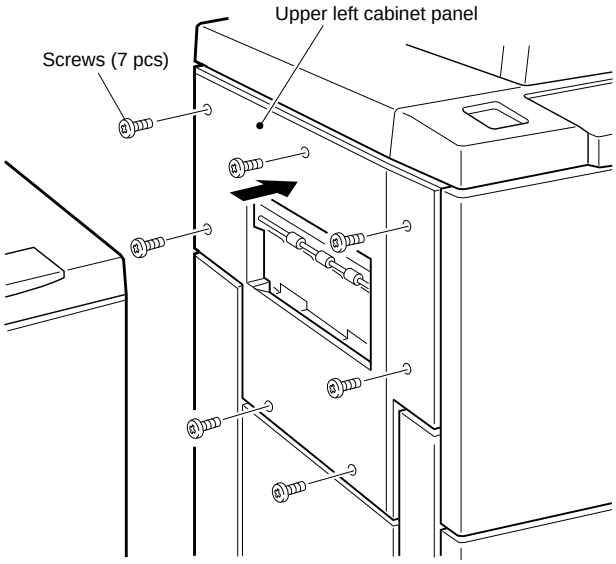
Then fit the lower left cabinet panel fixing wire back in its original position using the 1 screw.

Close the lower left cabinet panel and the toner collecting container cover.



7. Reattach the upper left cabinet panel to the copier.

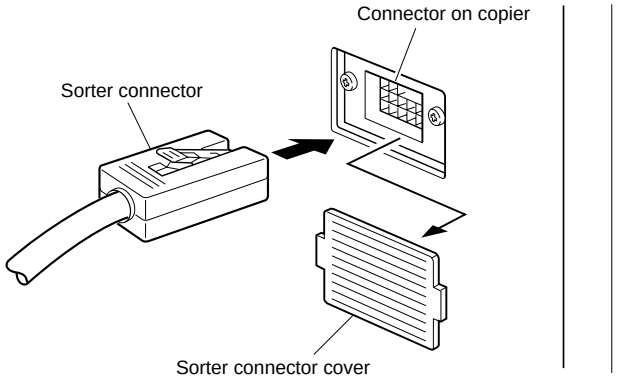
Fit the copier's upper left cabinet panel, removed in step 1, back in its original position, and secure it with the seven mounting screws.



8. Connect the sorter connector.

Remove the sorter connector cover from the copier's rear panel.

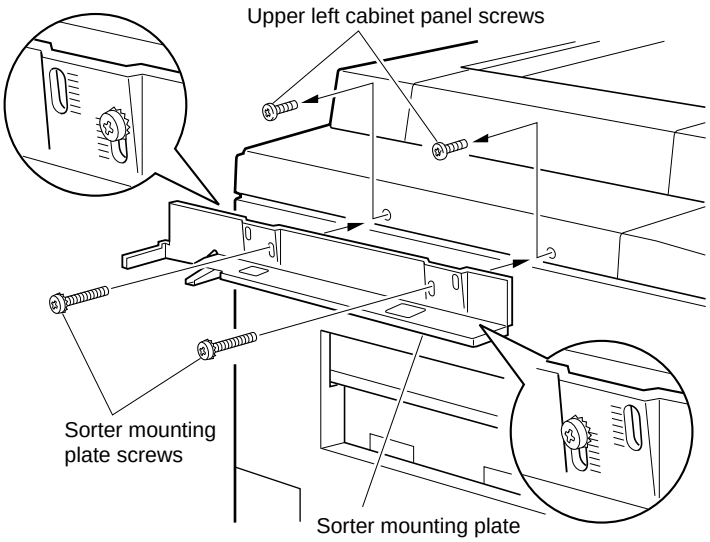
Then connect the sorter connector to the connector on the copier.



9. Attach the sorter mounting plate.

Remove the 2 screws from the copier's upper left cabinet panel. Attach the sorter mounting plate with the 2 sorter mounting plate screws (M4x16 with washer).

The sorter mounting plate screw holes are elongated; tighten the screws so that the sorter mounting plate hangs down in its lowest position, in the way shown in the figure.



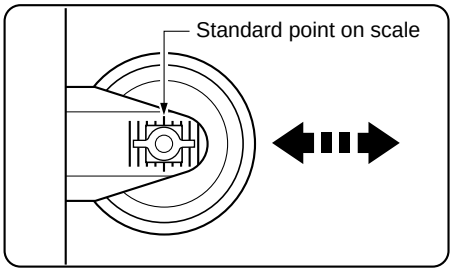
10. Confirm that the staple sorter can be attached and detached correctly.

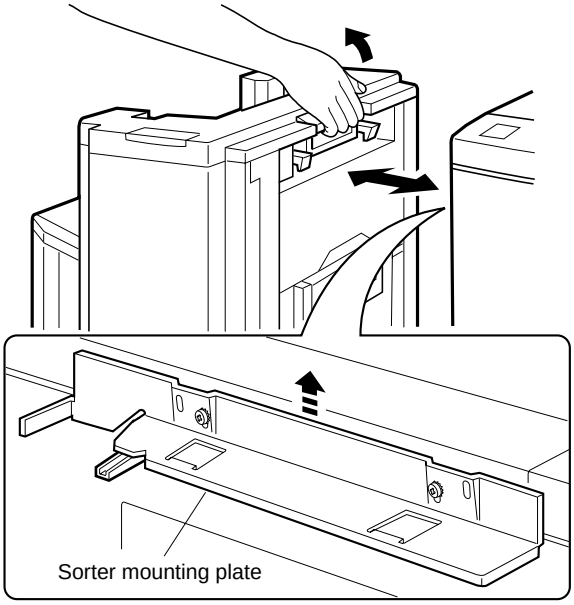
(1) Latch and unlatch the staple sorter from the copier to confirm that it moves smoothly.

(2) Confirm that the staple sorter locks into place beside the copier.

If not, adjust the height of the sorter mounting plate until the staple sorter locks securely into place.

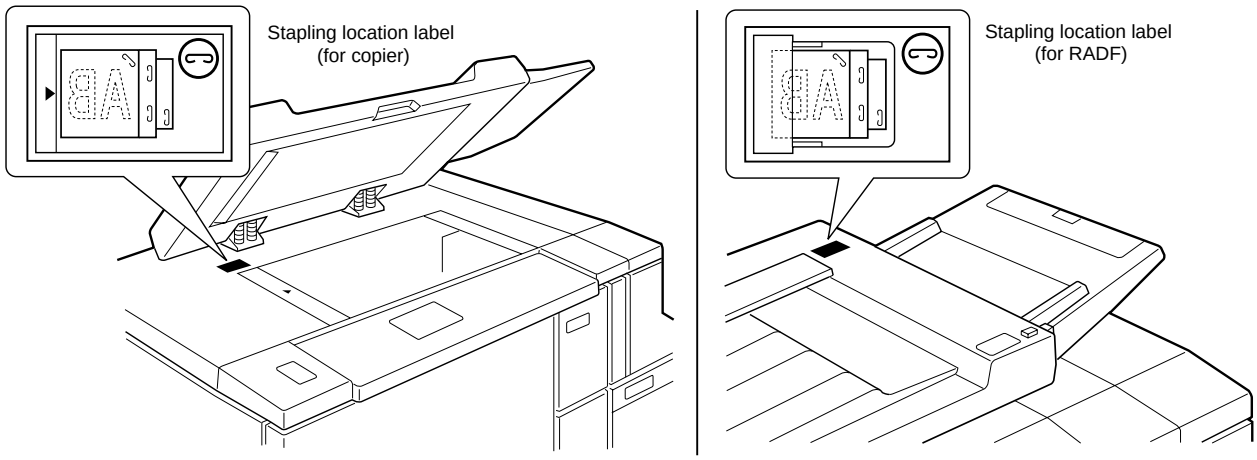
• If the above operation fails to make the staple sorter lock into place, the floor is probably not level. Alter the positions of the casters on the bottom of the sorter to adjust levelness.





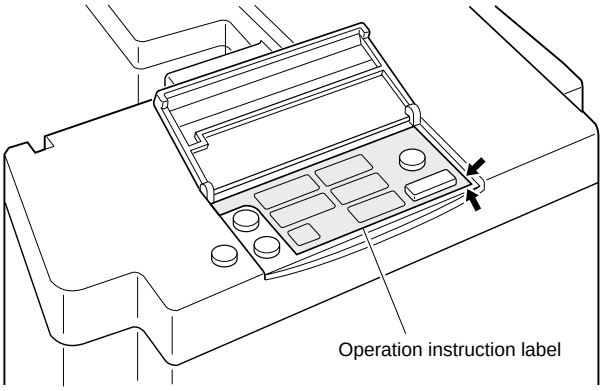
11. Affix the stapling location labels.

Affix the stapling location labels as shown in the figure.



12. Affix the label to the operation unit.

Align the right and bottom edges of the operation instruction label with the control unit's ribs, and stick the label on in that position.



Insert the copier's power plug into a grounded outlet, and turn the power switch on. Then, follow the procedure below.

13. Set the mode.

• Operate the keys on the copier to set the mode.

C / ⓥ → ⊐↵ → 0 / AUDIT CLEAR → ⊐↵ → 2 → 6 → ▬ → 0 / AUDIT CLEAR → 1 → ▬

Select an adequate number from the display of the operation panel using the 10-key pad. → ▬ to set the mode.

When this procedure is complete, see page 14, "Operation Check of Staple Sorter."

Staple sorter operation check

1. Check the sort mode.

Make 20 copies in the sort mode and confirm that the copies are distributed to the sort bins from the sorter.

2. Check the non-sort mode.

Make copies in the non-sort mode and confirm that they are sent to the non-sort bin.

3. Use the RADF (reversing automatic document feeder) and check the staple sort mode.

Place 2 or more sheets in the RADF and make copies in the staple sort mode. Confirm that the copies are distributed to the sort bins, that the staple guide bar arranges the copies and that the stapler functions properly.

If at this time the copies have not been stapled or the stapler is jammed, adjust the staples by performing one of the following procedures.

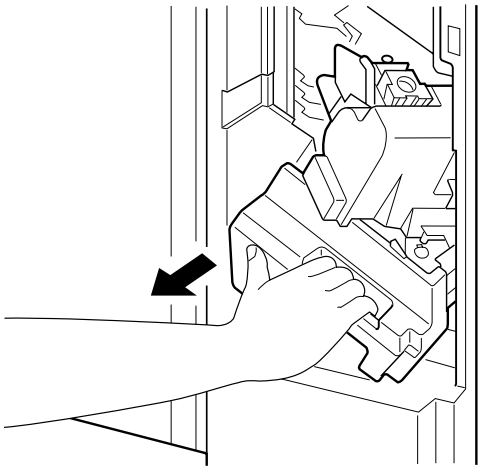
If the staples run out

• If the staples in the staple cartridge run out, the indicator for replenishment of staples will light up.

1. Pull out the stapler.

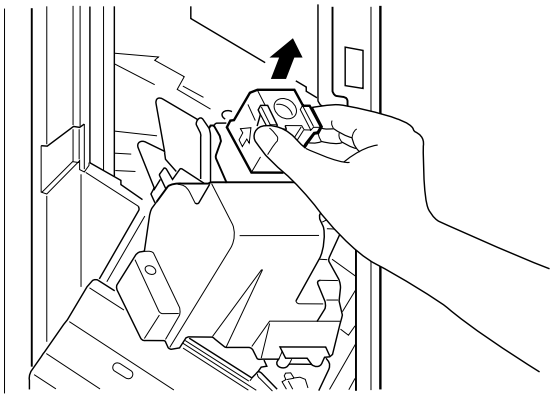
Open the stapler cover.

Grip and sgueeze the stapler's handle firmly so as to release the lock, and pull the stapler out gently as far as it will go.



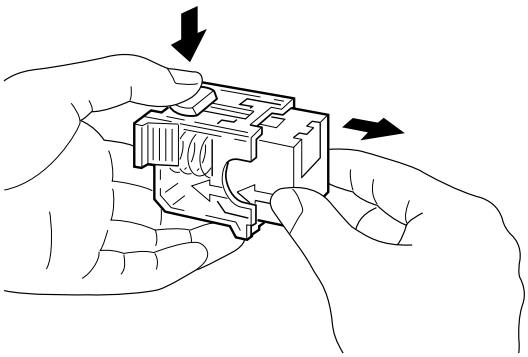
2. Remove the staple cartridge.

Remove the staple cartridge from the stapler.



3. Remove the empty staple case.

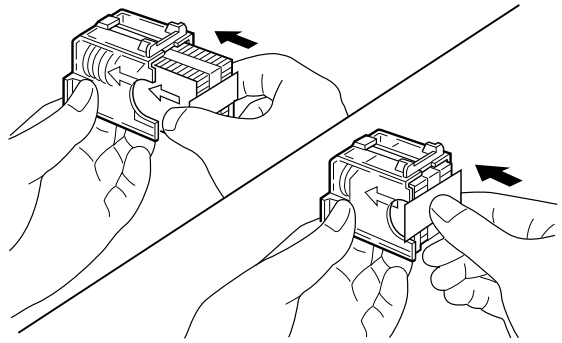
Press the green button on the staple cartridge, and remove the empty staple case from inside the cartridge.



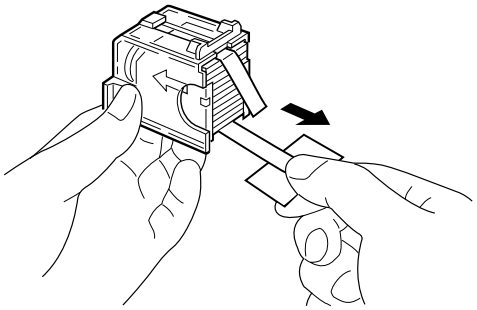
4. Fit a new case of staples inside the staple cartridge.

Fit a new case of staples inside the staple cartridge, in the way shown in the figure.

Make sure that the staple case is fitted securely in place inside the staple cartridge.

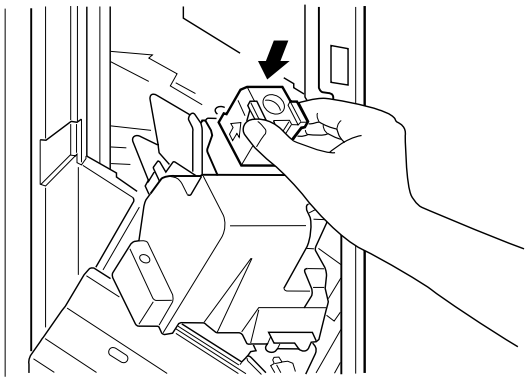


Next, gently remove the seal from the staples.



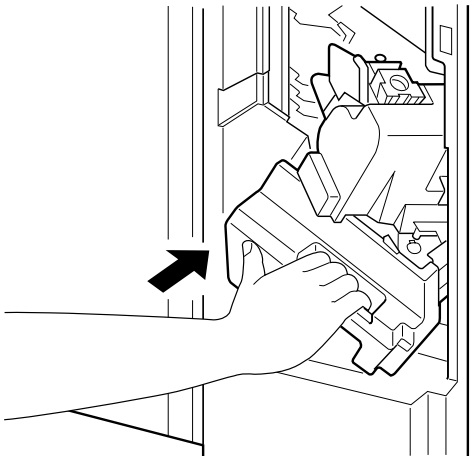
5. Reinsert the staple cartridge.

Push the staple cartridge in horizontally until it clicks securely into place.



6. Return the stapler to its original position.

Grasp the stapler's handle, and push the stapler in gently as far as it will go, Then close the stapler cover.



If staples have become jammed

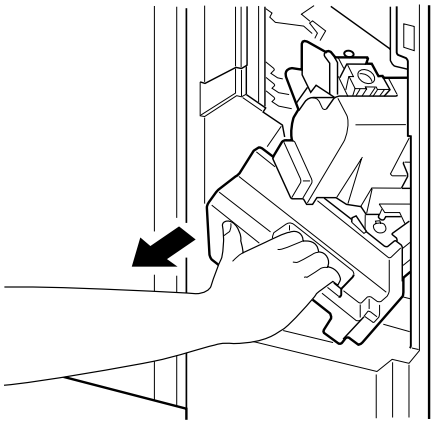
• If staples have become jammed in the stapler, the STAPLING START/STOP indicator will blink.

1. Pull out the stapler.

Turn off the copier's power switch, and remove the power plug from the socket.

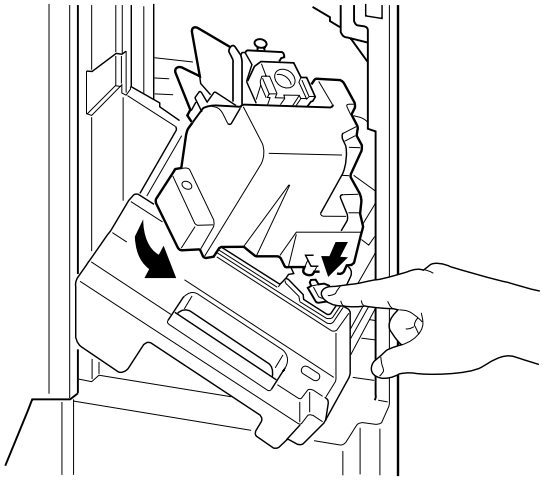
Then open the stapler cover.

Grip and sgueeze the stapler's handle firmly so as to release the lock, and pull the stapler out gently as far as it will go.



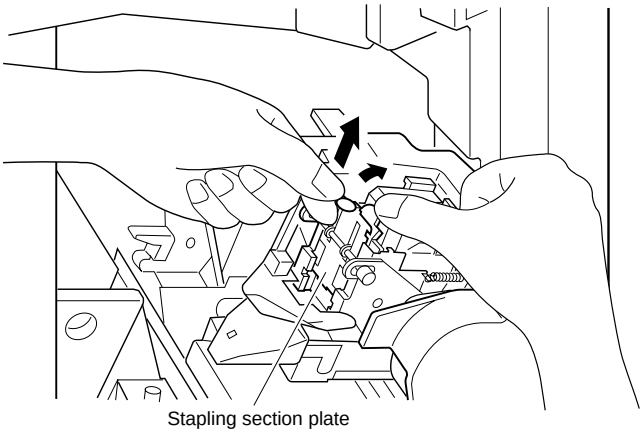
2. Release the stapler lock.

Press the stapler's lock release button (green) to release the stapler lock.



3. Open the stapling section.

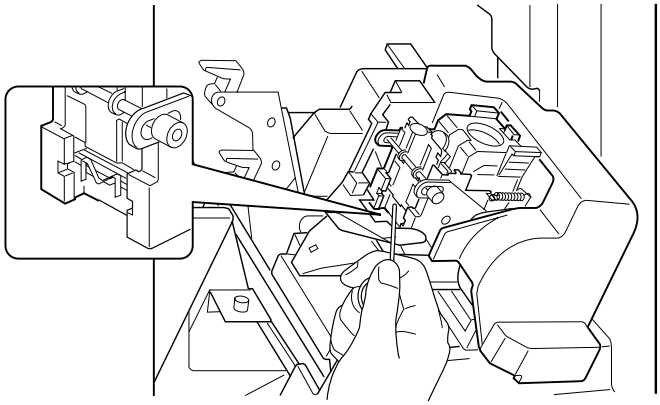
Open the stapling section by pushing up on the stapling section plate while pressing on the stapling section release lever.



Stapling section plate

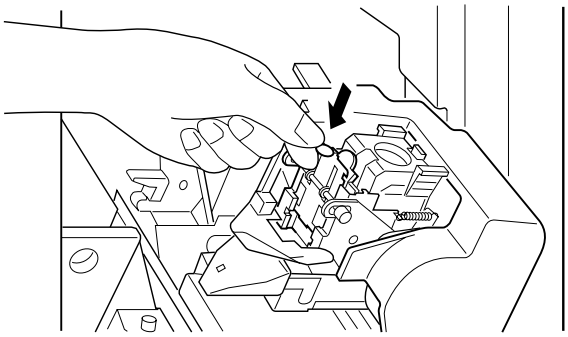
4. Remove the jammed staples.

Remove the jammed staples with the jam release tool supplied, as shown in the figure.

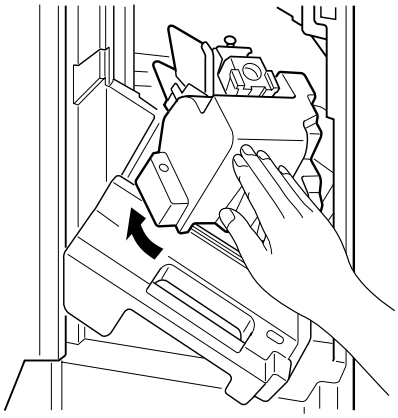


5. Close the stapling section, and return the stapler to its original position.

Press down on the stapling section plate and return it to its original position.



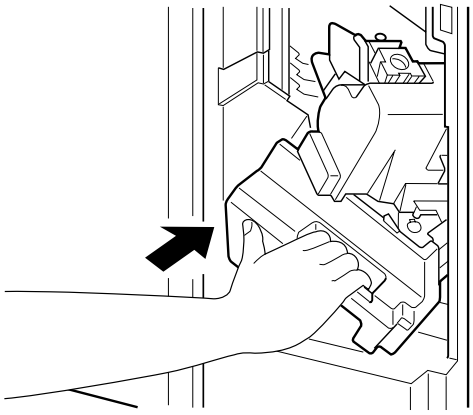
Return the stapler to its original position.
Make sure that it locks into place.



6. Return the stapler to its original position.

Grasp the stapler's handle, and push the stapler in gently as far as it will go.
Then close the stapler cover.

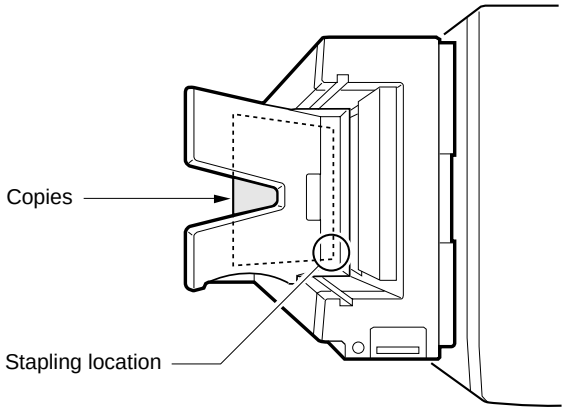
Plug the copier's power plug into its socket, and turn on the power switch.



7. Confirm that paper is stapled correctly.

Align the edges of the copies that you want to staple together.

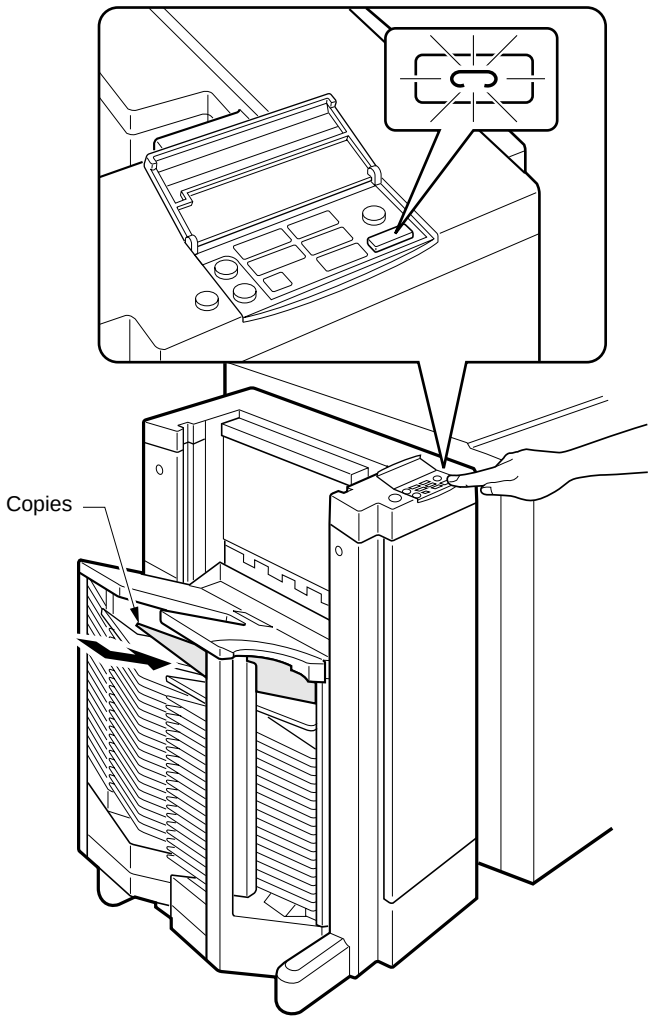
- Do not staple more than 50 copies together at one time.
  Attempting to staple more than 50 copies will lead to breakdown of the machine.



Place the copies to be stapled in the 2nd bin (below the non-sort bin).
Make sure that the staples will be applied in the correct location.
Insert the copies properly, so that they are touching the back of the bin.

Wait until the manual staple key indicator lights up. When it does, press the manual staple key.

Remove the copies from the 2nd bin, and check that they have been stapled.
If they have not, repeat the above operation.

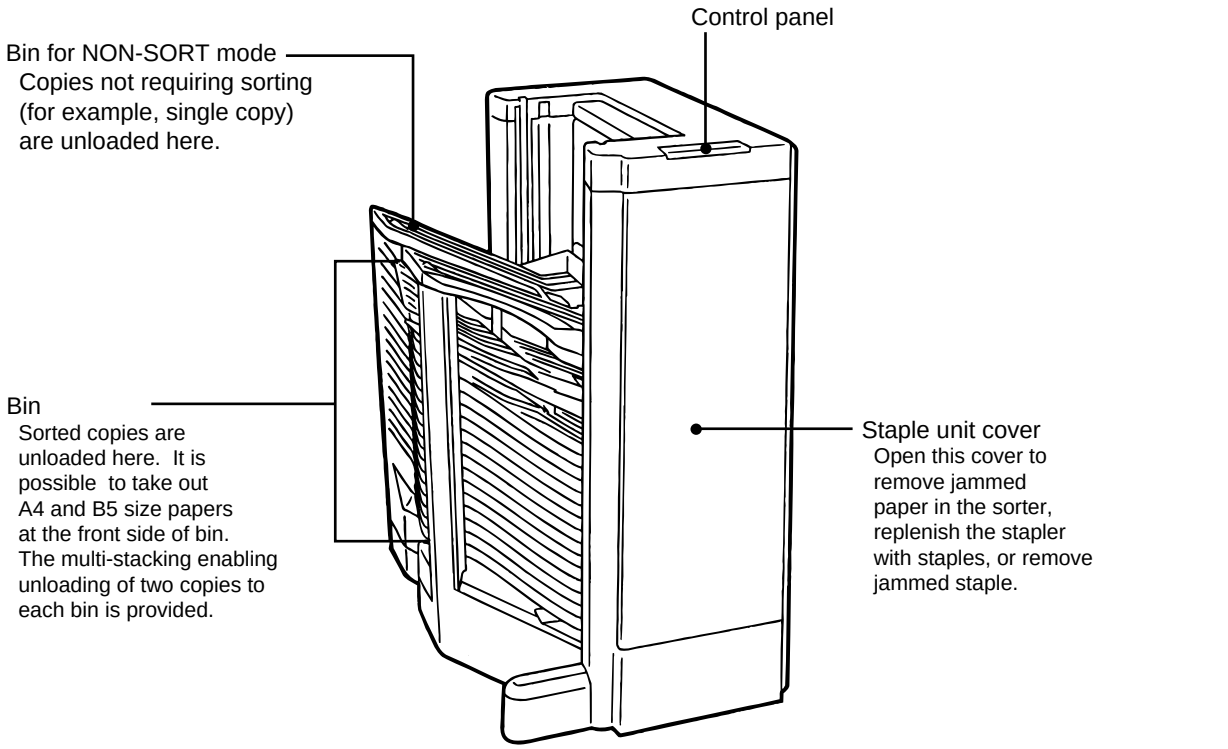


This completes the staple sorter installation.

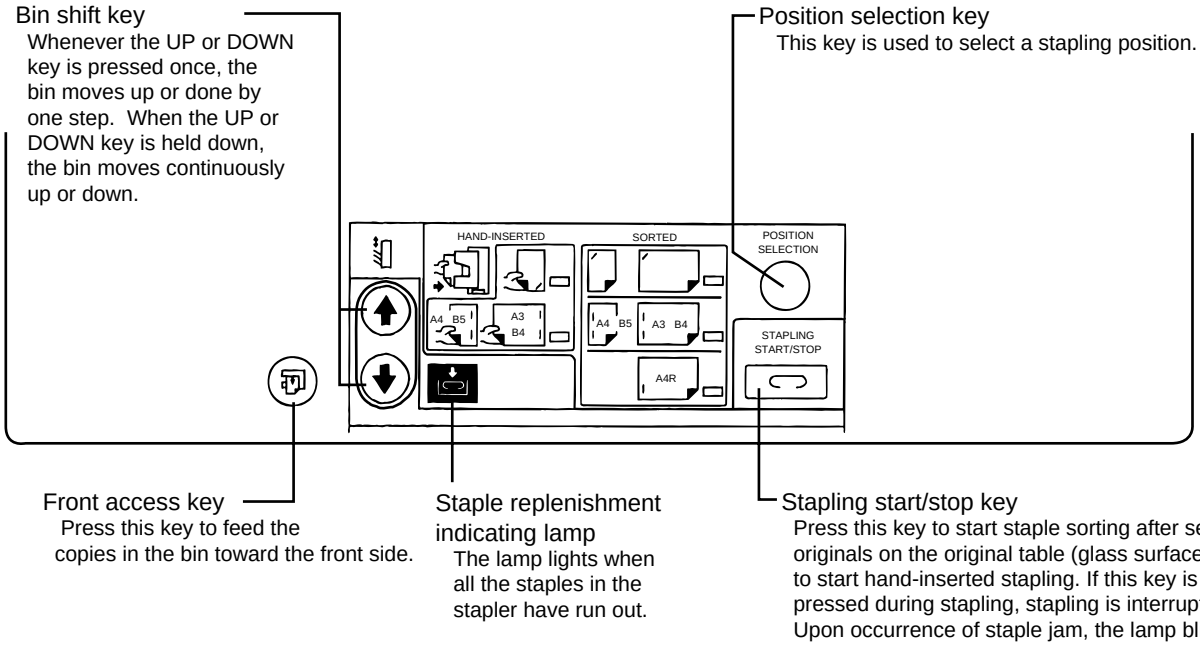
[3] Exeternal and internal structure

1. Exeternal parts

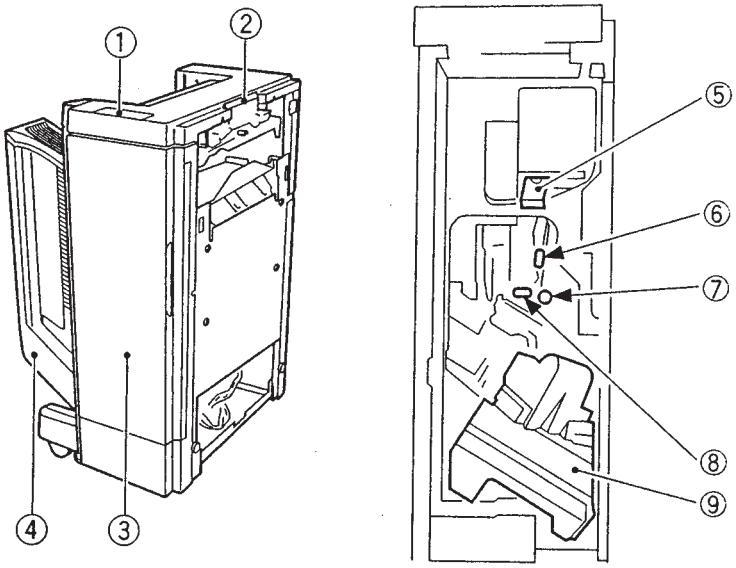
Parts of the machine


Control panel
Bin for NON-SORT mode
Copies not requiring sorting (for example, single copy) are unloaded here.
Bin
Sorted copies are unloaded here. It is possible to take out A4 and B5 size papers at the front side of bin. The multi-stacking enabling unloading of two copies to each bin is provided.
Staple unit cover
Open this cover to remove jammed paper in the sorter, replenish the stapler with staples, or remove jammed staple.

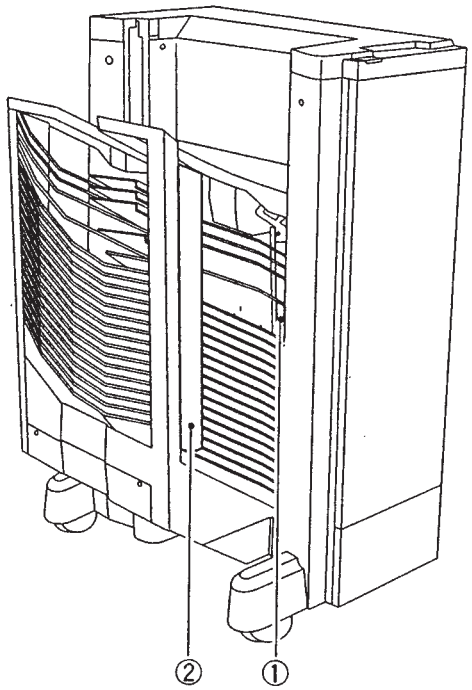
Control pane


Bin shift key
Whenever the UP or DOWN key is pressed once, the bin moves up or done by one step. When the UP or DOWN key is held down, the bin moves continuously up or down.
Position selection key
This key is used to select a stapling position.
HAND-INSERTED
SORTED
POSITION SELECTION
A4 B5
A3 B4
A4 B5
A3 B4
A4R
STAPLING START/STOP
Front access key
Press this key to feed the copies in the bin toward the front side.
Staple replenishment indicating lamp
The lamp lights when all the staples in the stapler have run out.
Stapling start/stop key
Press this key to start staple sorting after setting originals on the original table (glass surface) or to start hand-inserted stapling. If this key is pressed during stapling, stapling is interrupted. Upon occurrence of staple jam, the lamp blinks.

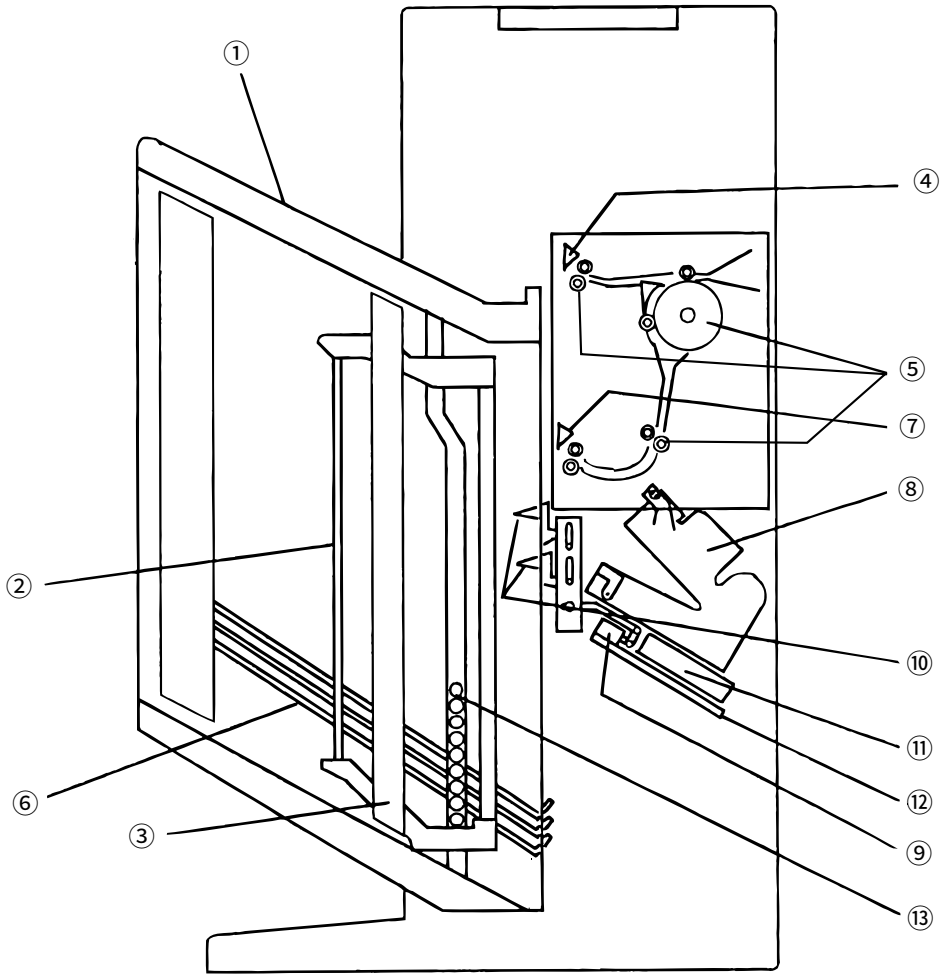
2. Internal parts



1. Control panel
2. Latch
3. Front door
4. Bin unit
5. Upper transfer guide
6. Intermediate transfer guide
7. Paper feed knob
8. Lower transfer guide
9. Stapler unit

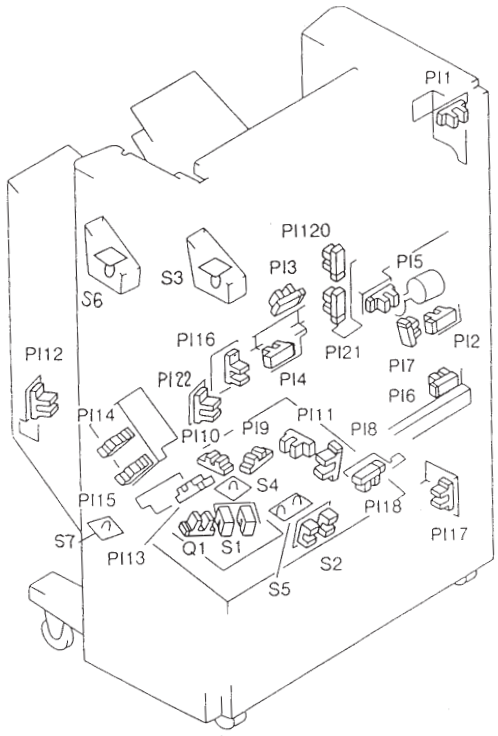


1. Push bar
2. Multi-guide



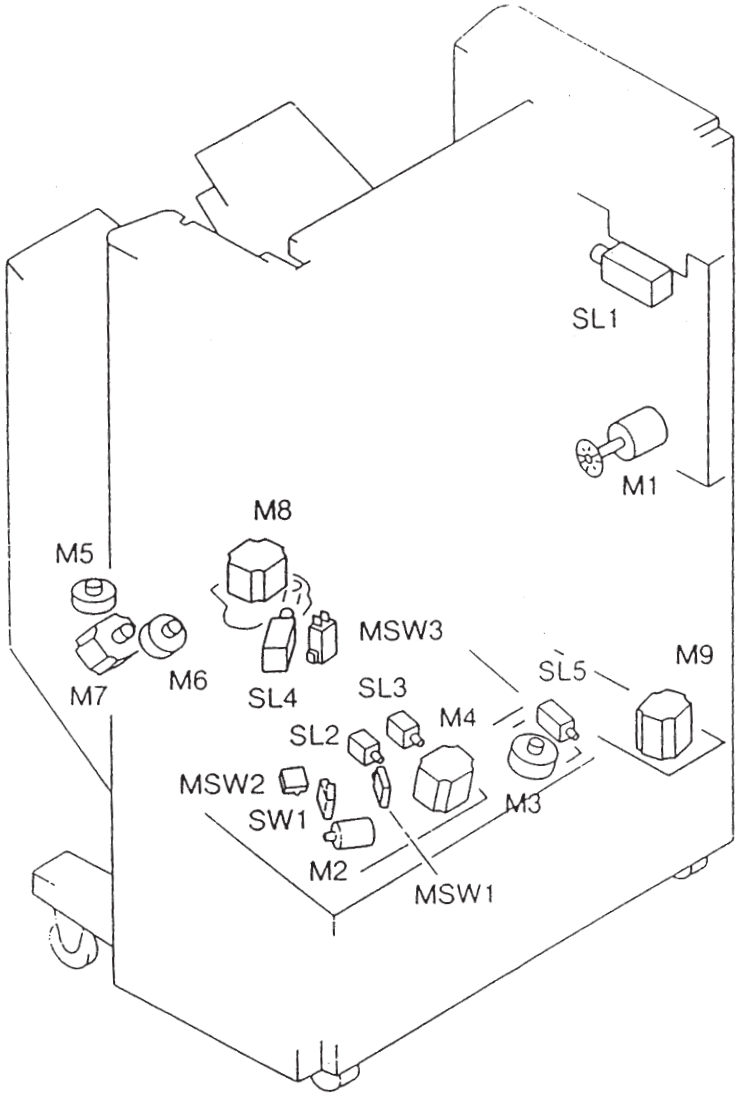
1. Non-sort bin
2. Guide bar
3. Push bar
4. Destaticizing brush 2
5. Transfer roller
6. Bin
7. Destaticizing brush 1
8. Stapler unit
9. Paper holder solenoid (SL3)
10. Paper holder arm
11. Stapler rocking unit
12. Stapler shift unit
13. Roller

3. Sensors and detectors



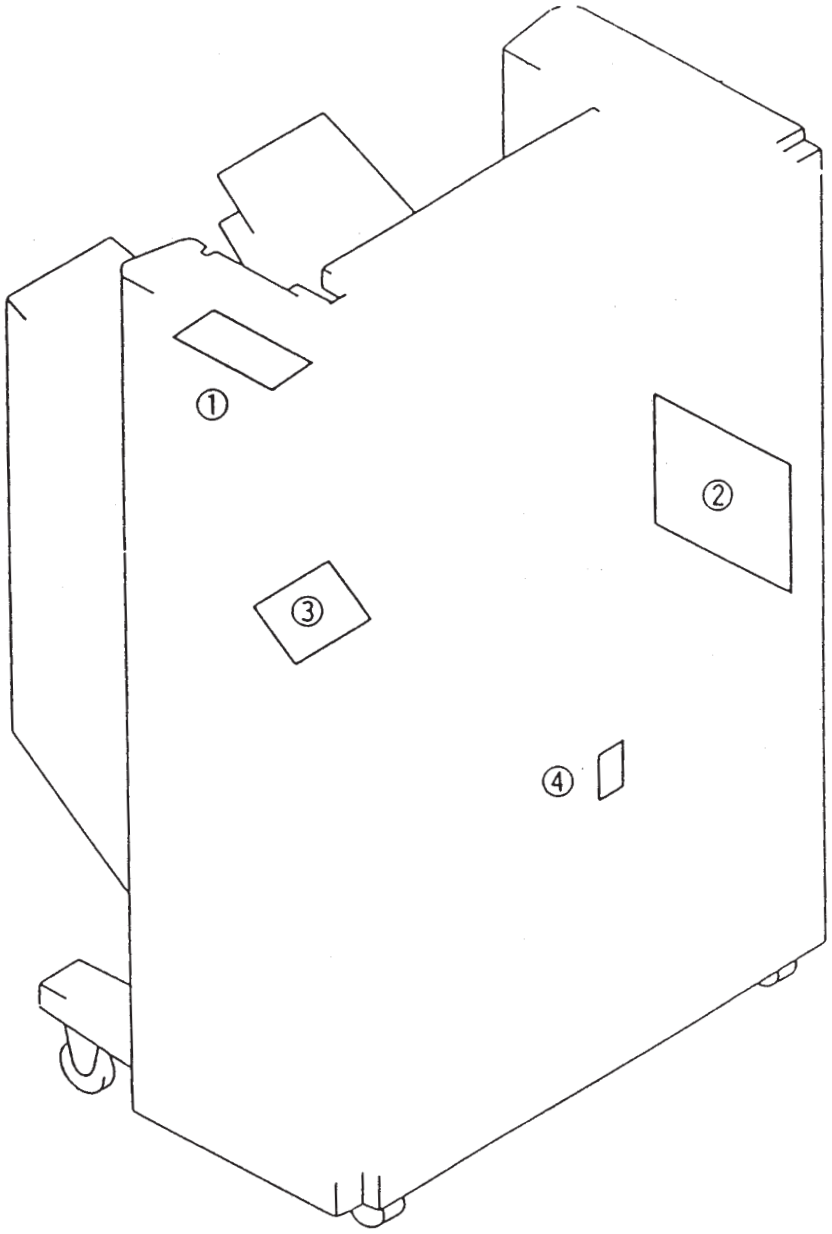
Mark	Name	Functions	Remarks
PI1	Joint detection	To detect that the sorter has been connected (installed) to the copying machine	Photointerrupter
PI2	Detection of 2-transfer guide UP	To detect that the transfer guide is UP (the transfer guide shifts up when double or single stapling is executed)	Photointerrupter
PI3	Non-sort paper detection	To detect that paper exists in the non-sort transfer section	Photointerrupter
PI4	Sort paper detection	To detect that paper exists in the sort transfer section	Photointerrupter
PI5	Detection of transfer motor clock	To detect rotational speed of transfer motor with the clock plate	Photointerrupter
PI6	Detection of transfer guide home position	To detect that the transfer guide is in its home position	Photointerrupter
PI7	Out-of-bin paper detection	To detect that paper exists between the sort bin and the transfer guide	Photointerrupter
PI8	Detection of stapler unit rocking motor clock	To detect rotational speed of stapler unit rocking motor with the clock plate	Photointerrupter
PI9	Detection of stapler unit rocking home position	To detect that the stapler unit is in its rocking home position	Photointerrupter
PI10	Detection of stapler unit rocking position	To check the position of stapler unit and to detect the final route (rotation direction) to return to the home position (rotation direction)	Photointerrupter
PI11	Paper holder detection	To detect that the paper holder arm is holding paper (the arm holds copies in case of stapling)	Photointerrupter
PI12	Multi-guide home position detection	To detect that the multi-guide is in its home position (the multi-guide is one of paper restricting plates)	Photointerrupter
PI13	Reference wall home position detection	To detect that the reference wall is in its home position (the reference wall is one of paper restriction plates)	Photointerrupter
PI14	Push bar home position detection	To detect that the push bar is in its home position (copy is pushed out in case of front access)	Photointerrupter
PI15	Push bar center position detection	To detect the push bar position	Photointerrupter
PI16	Guide bar home position detection	To detect that the guide bar is in its home position (the guide bar has the function to align papers and to push out copies in case of front side access).	Photointerrupter
PI17	Bin shift motor clock detection	To detect rotational speed of bin shift motor with the clock plate	Photointerrupter
PI18	Bin unit home position detection	To detect that the bin unit is in its home position	Photointerrupter
PI20	Lead cam position detection	To detect that the lead cam is in the horizontal area	Photointerrupter
PI21	Lead cam center position detection	To detect that the lead cam is in the center position of horizontal area	Photointerrupter
PI22	Door sensor	To detect that the front door is opened or closed	Photointerrupter
Q1	Detection of stapling home position	To detect one stapling operation (one turn of cam)	Photointerrupter
S1	Detection of stapler unit direction	To detect direction of stapler unit (the stapler has two directions, one of which is selected depending on stapling process).	Sensor PWB
S2	Detection of stapler unit shift position	To detect the home position of stapler shift and stapling position	Sensor PWB
S3	Detection of paper in bin unit (light emitting section)	To detect existence of paper in bin (at paper unloading side)	LED and phototransistor
S4	Detection of paper in bin unit (light receiving section)		
S5	Detection of paper in stapler	To detect existence of paper in the stapling section of staple unit	LED and phototransistortransmitting sensor
S6	Detection 2 of paper in bin unit (light emitting section)	To detect existence of paper in bin (front part of bin)	LED and phototransistor
S7	Detection 2 of paper in bin unit (light receiving section)		

4. Motors, switches and solenoids



Mark	Name	Functions	Remarks
M1	Transport motor	To carry the copies and to raise the transfer guide	DC brush motor
M2	Staple motor	To drive for stapling operation	DC brush motor
M3	Stapler unit shift motor	To shift to the staple position (corner stapling, single stapling, double stapling)	Pulse motor
M4	Stapler unit rocking motor	To shift to staple position and to shift to the escape position in case of bin shift	Pulse motor
M5	MULTI-GUIDE motor	To shift the multi-guide composing the restricting plate according to the paper size and copy mode	Pulse motor
M6	Reference wall motor	To shift the reference wall composing the restricting plate according to paper size and copy mode	Pulse motor
M7	Push bar motor	To push out unloaded copies in case of front access	Pulse motor
M8	Guide bar motor	To align unloaded copies and to push out at front side	Pulse motor
M9	Bin shift motor	To shift up and down the bin	Pulse motor
MSW1	Stapler safety detection	To stop stapler motor drive when a operator's finger is inserted into the staple position in bin	Microswitch
MSW2	Detection of rocking stop position	To supply power to the staple motor only when the stapler unit is in the specified stapling position	Microswitch
MSW3	Front door opening-closing detection	To stop drive of bin shift and bin unit when the front door is opened	Microswitch
SW1	Detection of nonexistence of staple	To detect nonexistence of staple in staple cartridge	Microswitch
SL1	Paper path selection solenoid	To change unloading of copies to the non-sort bin or sort bin according to mode	Solenoid
SL2	Stapler position fixing pawl releasing solenoid	To fix the stapler unit in specific stapling position (corner stapling, single stapling, double stapling)	Solenoid
SL3	Paper holder solenoid	To hold down copies in case of stapling	Solenoid
SL4	Gear selection solenoid	To change gear ratio of drive system when copy is pushed out by the guide bar	Solenoid
SL5	Stapler unit fixing release solenoid	To fix with the fixing pawl when the staple unit is in the home position of shift operation	Solenoid

5. PWB



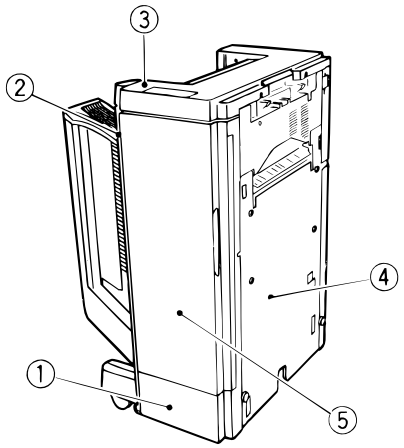
Mark	Parts names
1	Control panel PWB
2	Sorter controller PWB
3	Bin unit control PWB
4	Pin shift motor driver

[4] Disassembly and assembly

1. External parts

To clean, check or repair the internal parts of the machine, remove the covers in the following procedure.

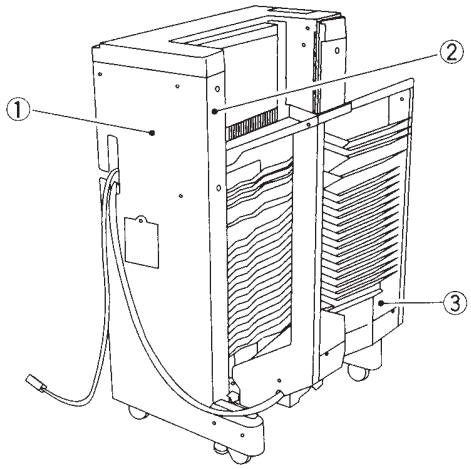
The removal procedure for the covers which can be removed easily and independently merely by removing their set screws is not described here.



1. Front cover
2. Front support cover (2)
3. Upper cover (4)
4. Right upper cover (2)
5. Right lower cover (4)
6. Front door

Caution

When removing the upper cover, take care so that the connector provided at the back side of control panel is not damaged.

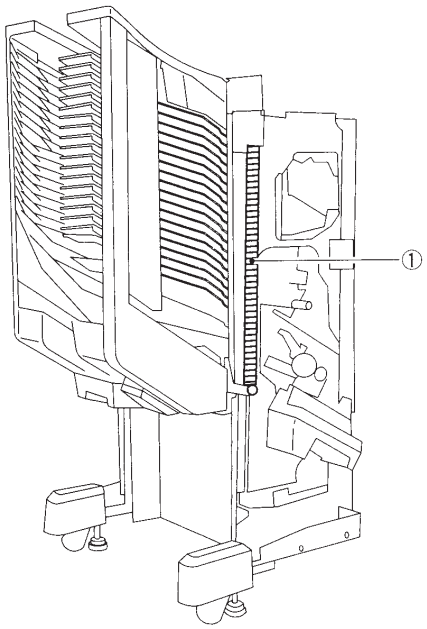


1. Rear cover (4)
2. Rear support cover (5)
3. Bin unit (2)

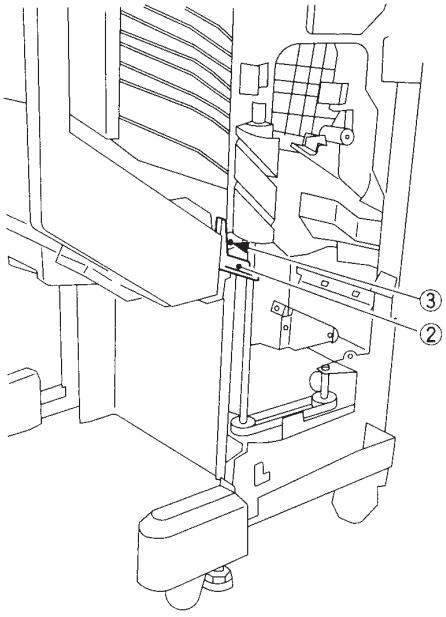
2. Bin unit

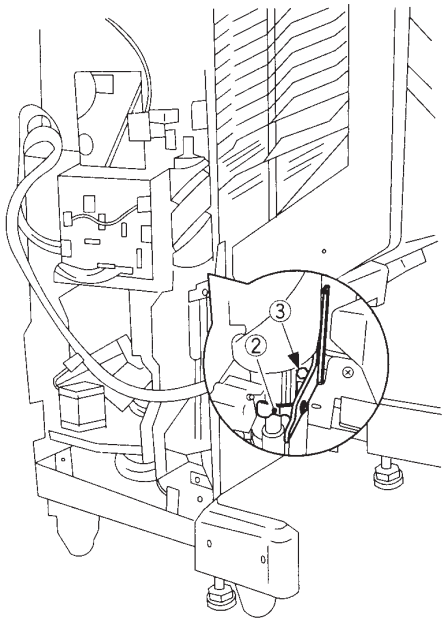
A. Removing the bin unit

1) Turn on the power supply for the copying machine, press the UP key (bin shift key) provided on the control panel of the machine to shift the bin up to the upper limit.
2) Turn off the power supply of copying machine.
3) Remove the front cover, front support cover, rear cover, and rear support cover.
4) Remove the spring (1) provided at the front/rear side of bin unit.



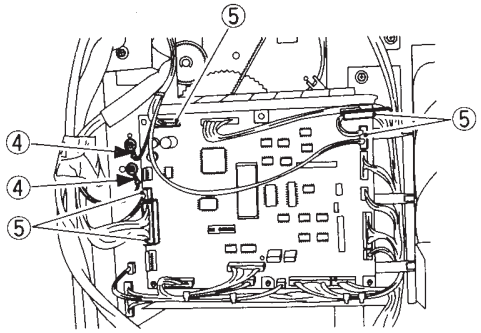
5) Remove the screw (3) to remove the frame holder (2) provided at the front/rear side of bin unit.



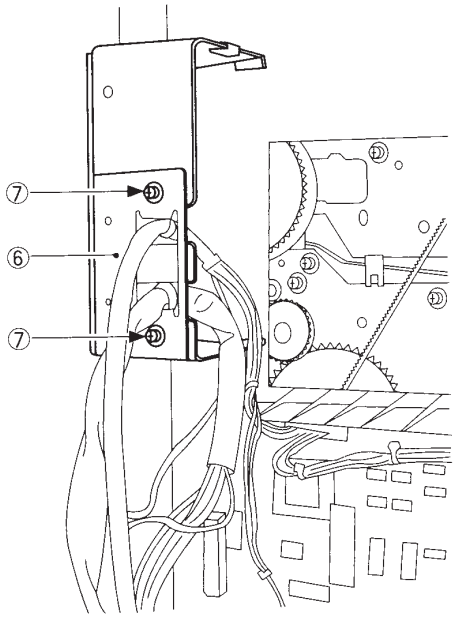


Rear side

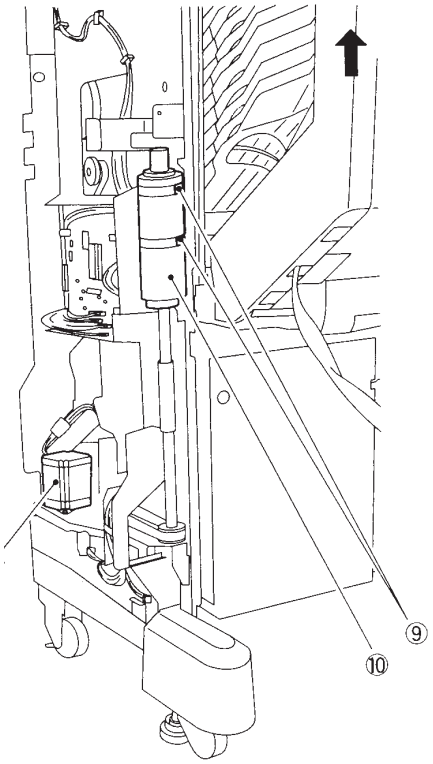
6) Remove the earth wires (4) (2 pcs.) and the connectors (5) (5 pcs.).



7) Remove the screws (7) (2 pcs.) to remove the signal code plate (6).



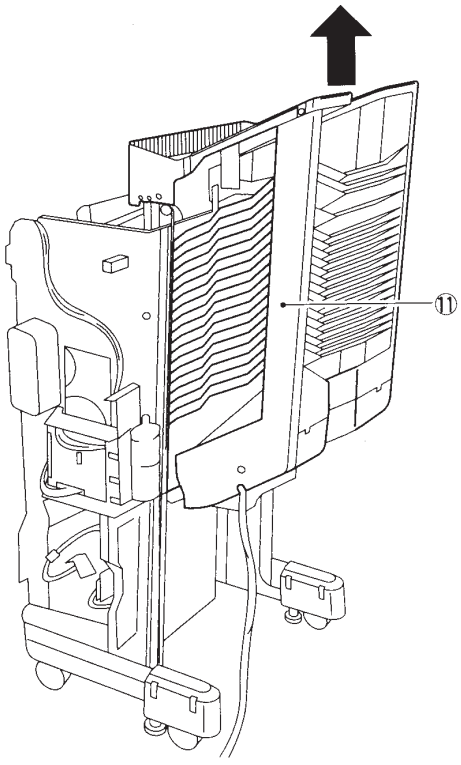
8) Holding the bin unit raised, turn the shaft of bin shift motor (8) to shift all the rollers (9) to above the lead cam (10).



9) Raise the bin unit (11), and remove it.

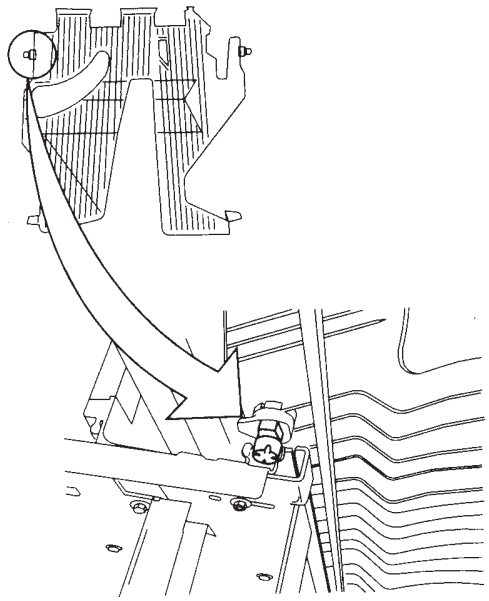
Caution

Weight of bin unit: Approx. 17 kg



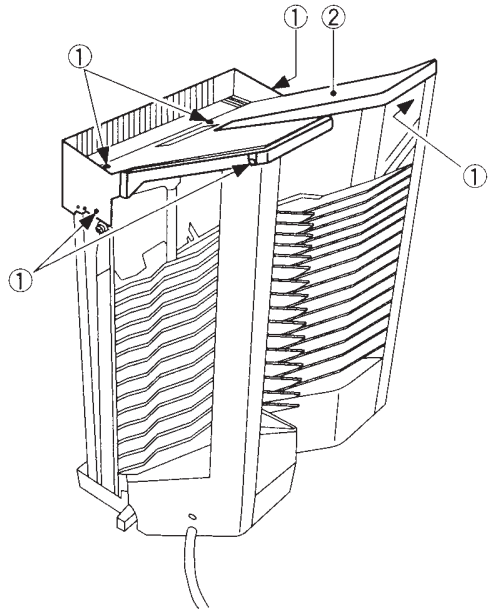
Caution

When installing the bin unit, pay attention to the position of rollers provided at both sides of bin unit.

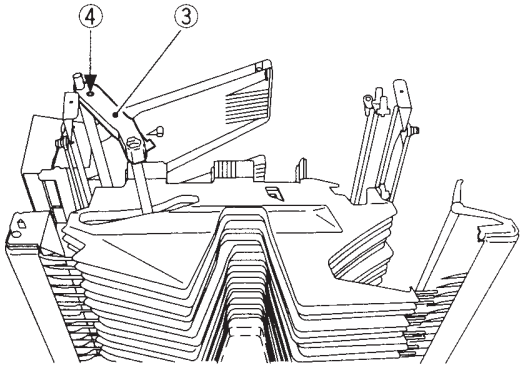


B. Removing the bin

1) Remove the bin unit from the sorter.
2) Remove the screws (1) (6 pcs.) to remove the non-sort bin (2).



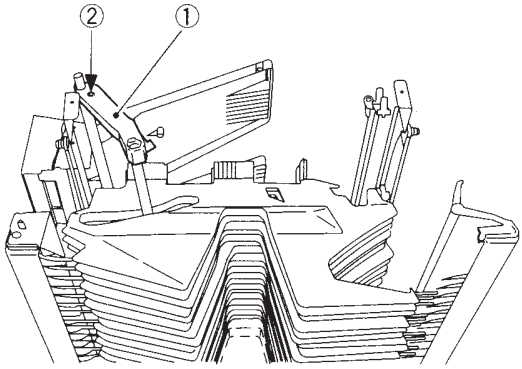
3) Remove the screw (4) (1 pc.) to remove the guide holder (3).



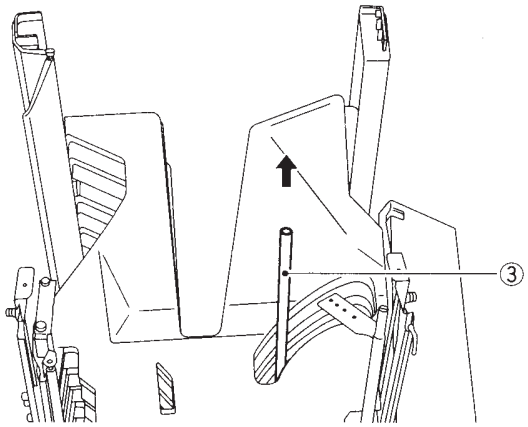
4) Paying attention to the pin unit frame, remove the bin.

C. Removing the guide bar unit

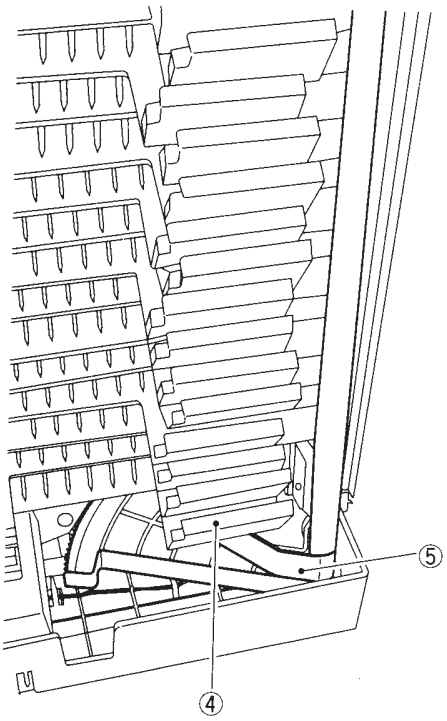
1) Remove the bin unit from the sorter.
2) Remove the non-sort bin.
3) Remove the screw (2) (1 pc.) to remove the guide holder (1).



4) Withdraw upward the guide bar (3).

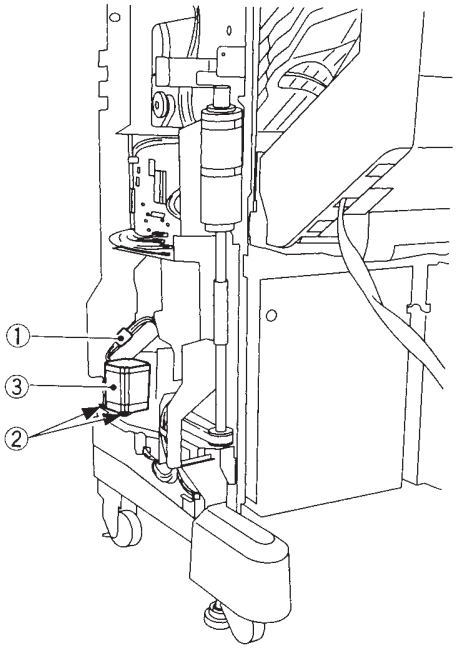


5) Holding the bin (4) raised a little, remove the holder (5).



D. Removing the bin shift motor (M9)

1) Remove the upper cover and rear cover.
2) Remove the connector (1) and screws (2) (2 pcs.) to remove the bin shift motor (3).



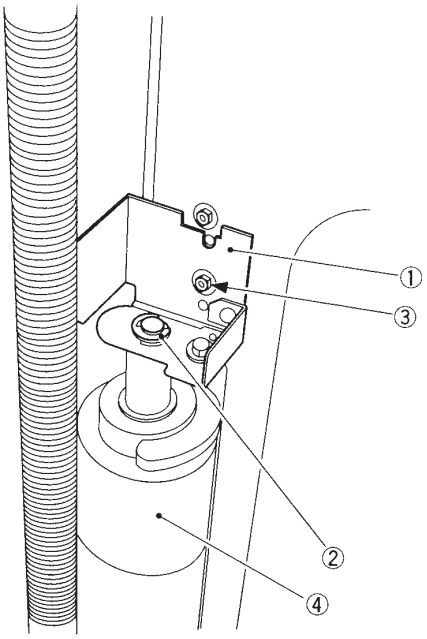
E. Removing the lead cam

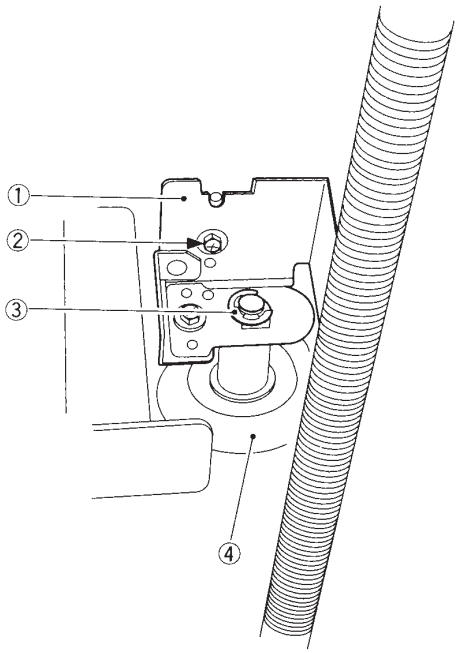
1) Turn on the power supply for the copying machine, press the DOWN key (bin shift key) on the control panel of machine to shift the bin unit down to the lowermost position.

Caution

If both rear/front side lead cams are removed together, the bin unit falls down. Be sure to remove one after the other.

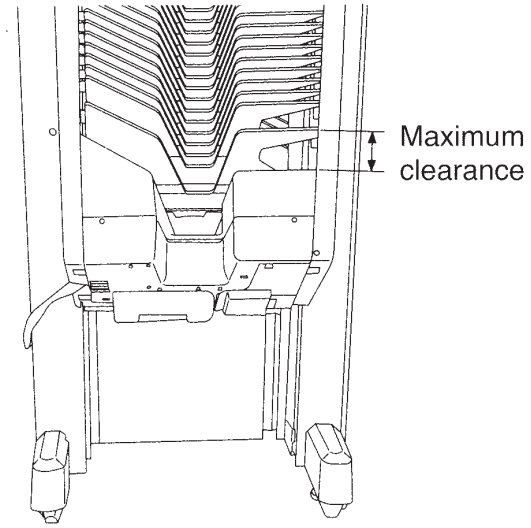
2) Turn off the power supply for the copying machine.
3) Remove the E ring (2) and screw (3) (1 pc.) to remove the lead cam holder, and then remove the lead cam (4).



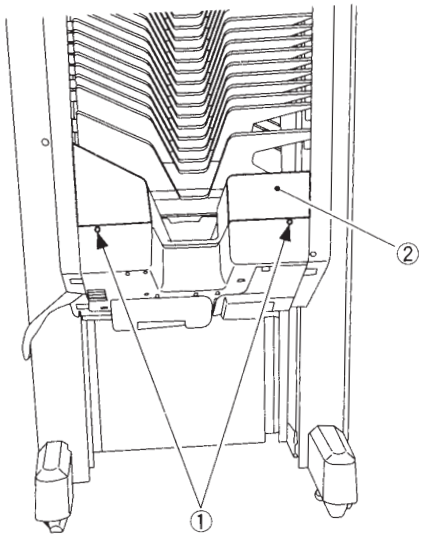


F. Removing the push bar motor (M7)

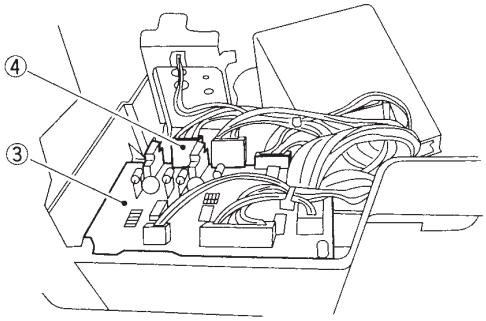
1) Turn on the power supply for the copying machine, operate the bin shift key of control panel of the machine to get the maximum clearance between the lowermost bin and the bottom of bin unit.



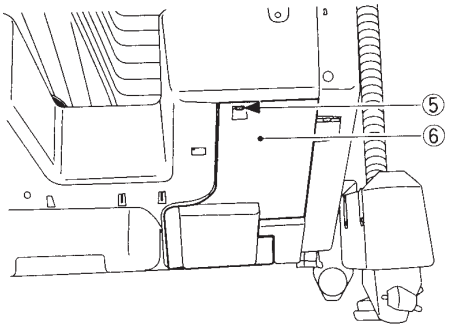
2) Turn off the power supply for the copying machine.
3) Remove the screws (1) (2 pcs.) to remove the bin unit cover (2)



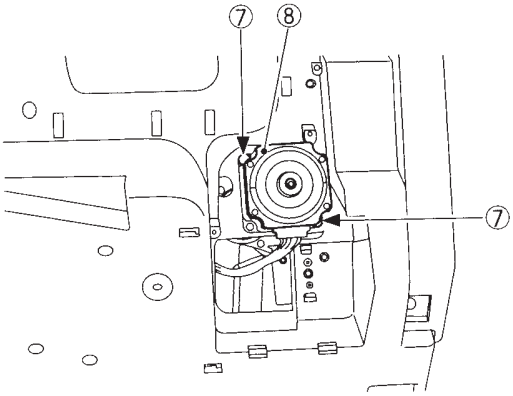
4) Remove the connector J306 (4) provided on the bin unit control PWB (3).



5) Remove the screw (5) (1 pc.) to remove the motor cover (6).

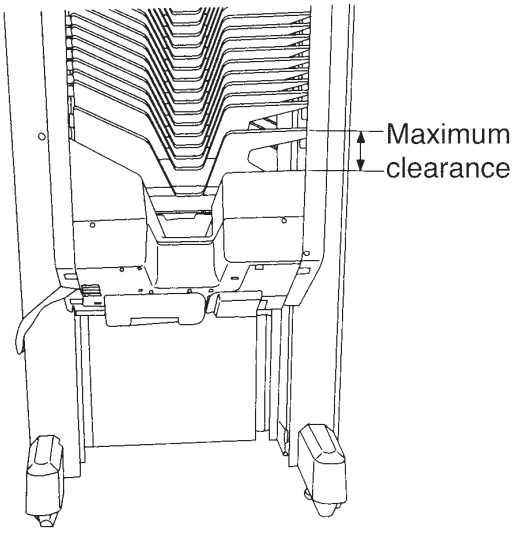


6) Remove the screws (7) (2 pcs.) to remove the push bar motor (8).



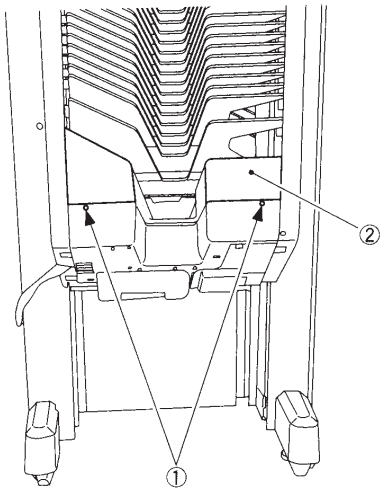
G. Removing the reference wall motor (M6)

1) Turn on the power supply for the copying machine, and operate the pin shift key of control panel of the machine so as to get the maximum clearance between the lowermost bin and the bottom of bin unit.

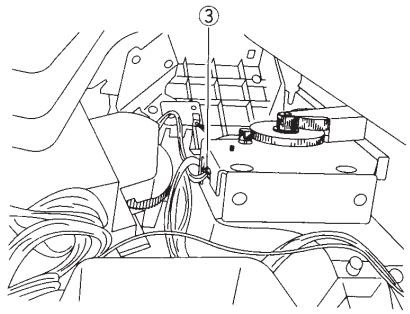


2) Turn off the power supply for the copying machine.

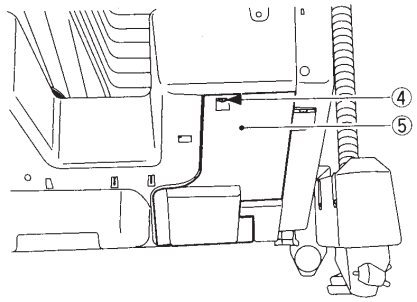
3) Remove the screws (2) (2 pcs.) to remove the bin unit cover (2).



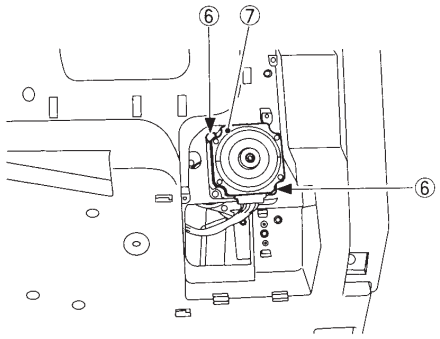
4) Remove the reference wall motor connector (3).



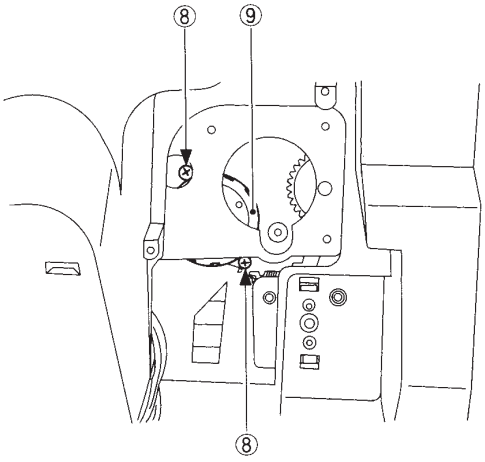
5) Remove the screw (4) (1 pc.) to remove the motor cover (5)



6) Remove the screws (6) (2 pcs.) to remove push bar motor (7).

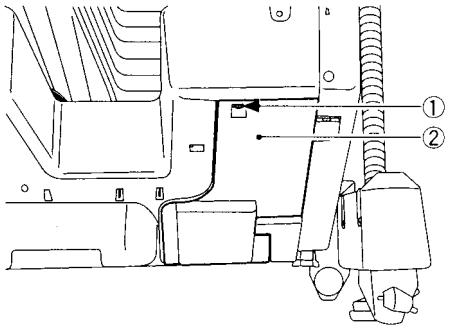


7) Remove the screws (8) (2 pcs.) to remove the reference wall motor (9).

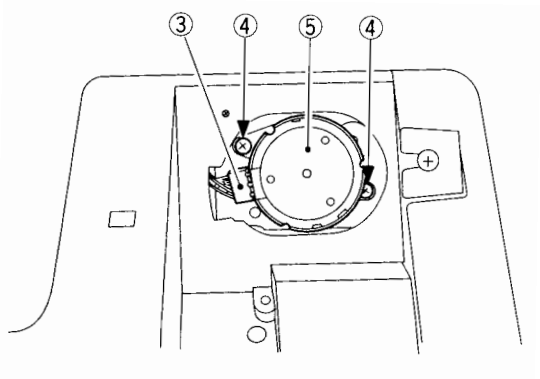


H. Removing the multi-guide motor (M5)

1) Remove the screw (1) (1 pc.) to remove the motor cover (2).

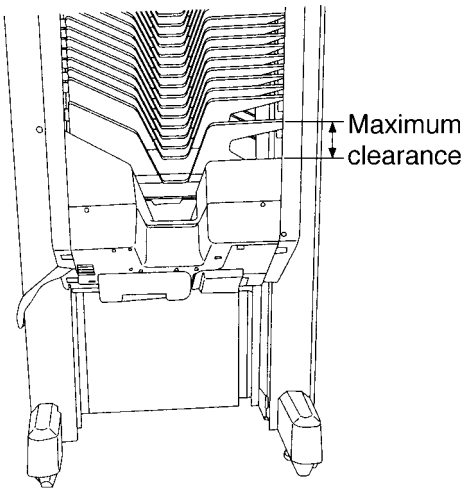


2) Remove the multi-guide motor connector (3), and remove the screws (4) (2 pcs.) to remove the multi-guide motor (5).

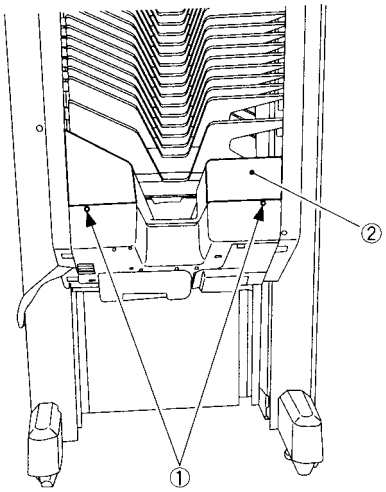


I. Removing the guide motor (M8)

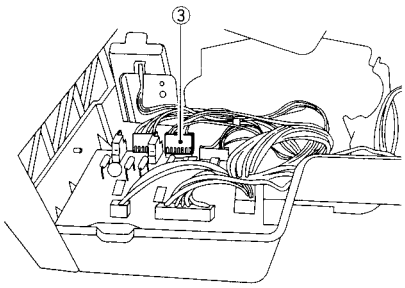
1) Turn on the power supply for the copying machine, and operate the bin shift key of control panel of the machine to get the maximum clearance between the lowermost bin and the bottom of unit.



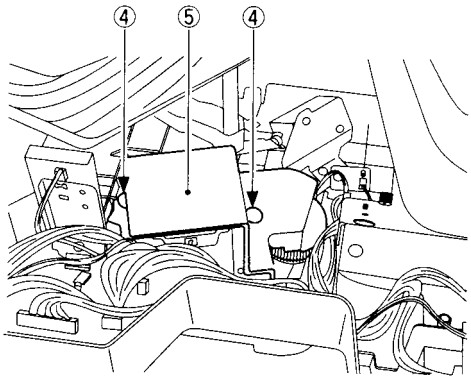
2) Turn off the power supply for the copying machine.
3) Remove the screws (1) (2 pcs.) to remove the bin unit cover (2).



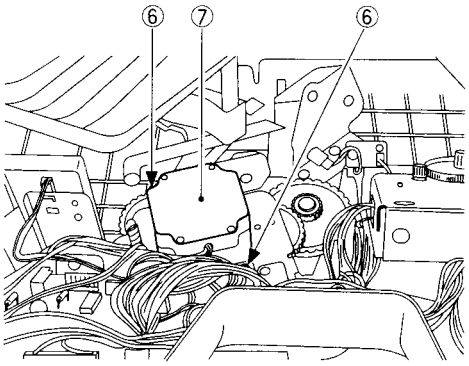
4) Remove the connector J307 (3) provided on the bin unit control PWB.



5) Remove the screws (4) (2 pcs.) to remove the guide bar motor cover (5).



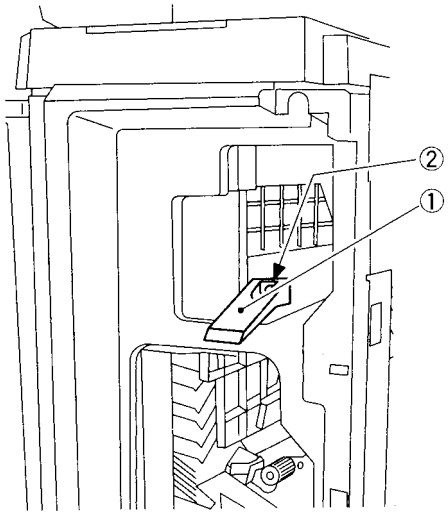
6) Remove the screws (6) (2 pcs.) to remove the guide bar motor (7).



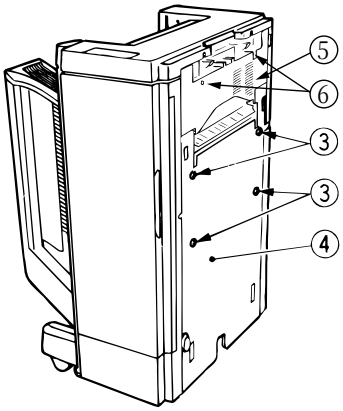
3. Transfer unit

A. Removing the transfer unit

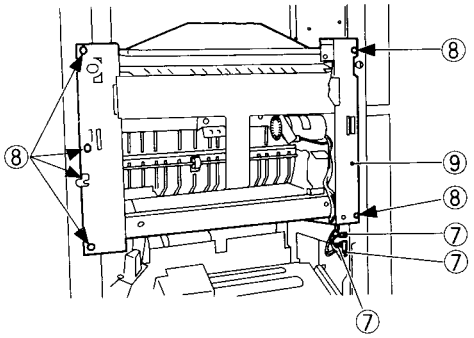
1) Open the front door, and remove the screw (2) to remove the handle (1).



2) Remove 4 screws (3) and 2 screws (6), and remove the right lower cover (4) and right upper cover (5).

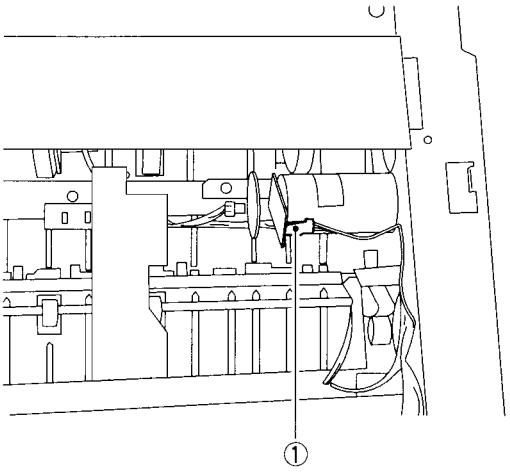


3) Remove the three connectors (7) and the screws (8) (4 pcs.) to remove the transfer unit (9).

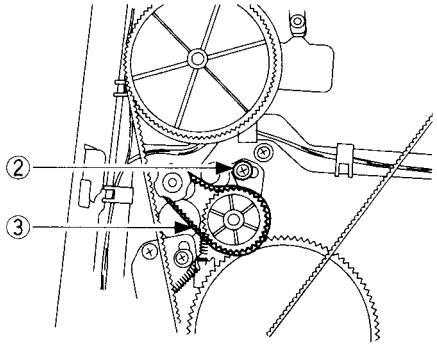


B. Removing the transfer unit (M1)

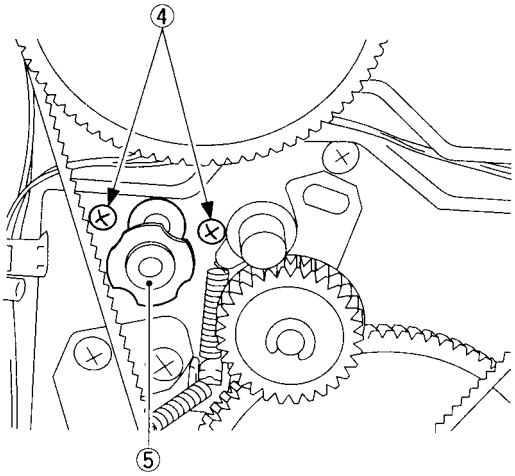
1) Remove the transfer unit.
2) Remove the connector (1) of transfer motor section.



3) Remove the tensioner fixing screw (2) to remove the drive belt (3).



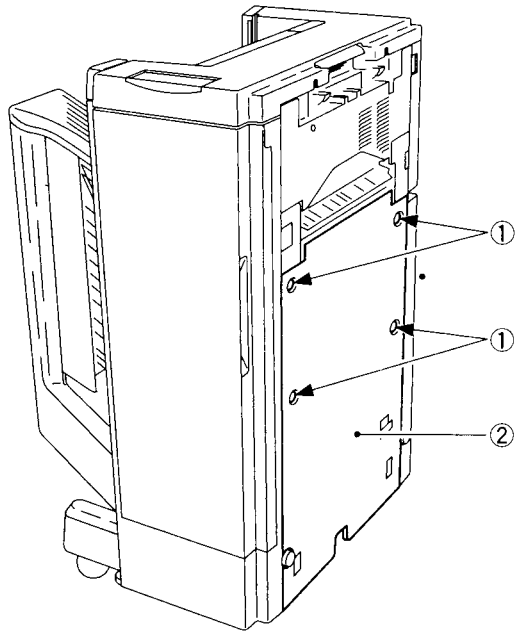
4) Remove the screws (4) (2 pcs.) to remove the transfer motor (5).



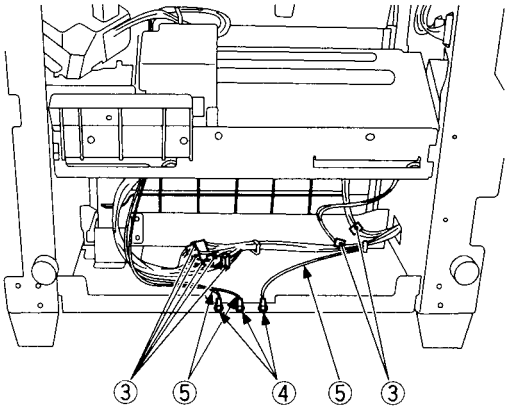
4. Stapler shift unit

A. Removing the stapler shift unit

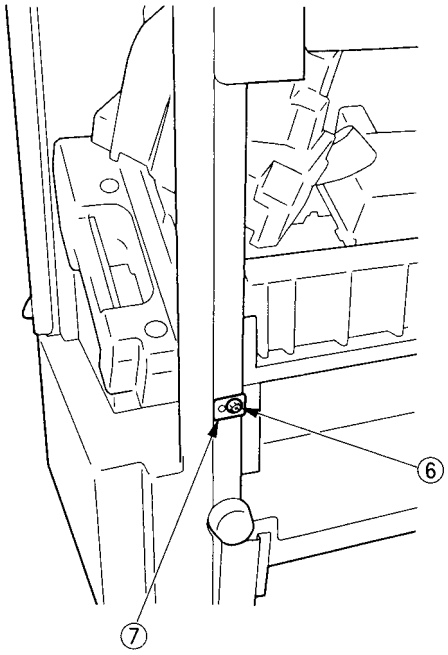
1) Remove the screws (1) (4 pcs.) to remove the right lower cover (2).



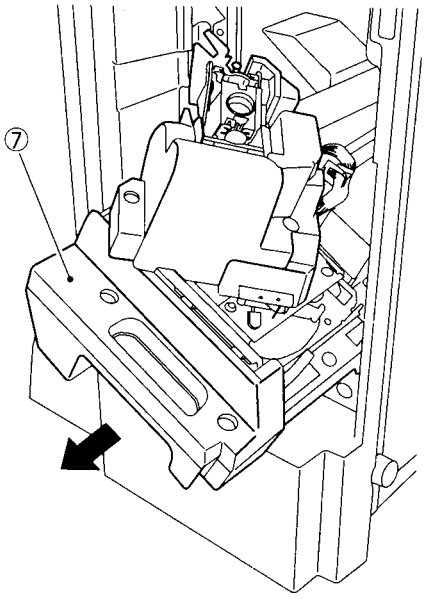
2) Remove the 7 connectors (3) and the screws (4) to remove the earth cables (5) (3 pcs.).



3) Remove the screw (6) (1 pc.) to remove the stopper (7).

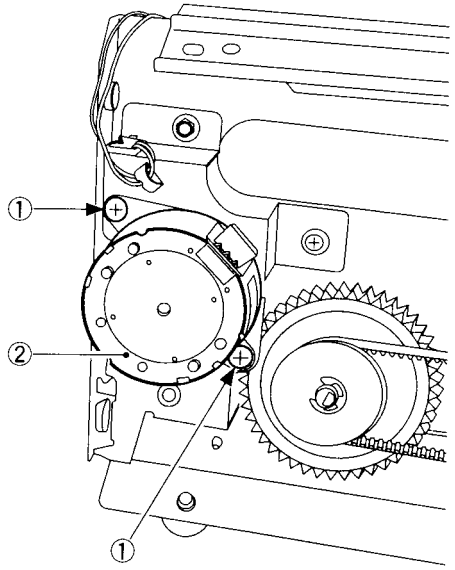


4) Draw out the stapler shift unit toward this side (7), and remove it.



B. Removing the stapler unit shift motor

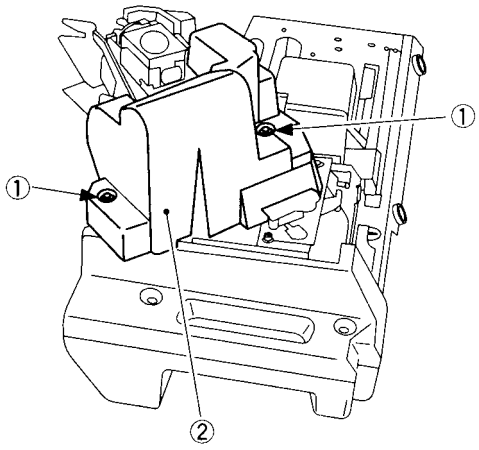
1) Remove the stapler shift unit.
2) Remove the screws (1) (2 pcs.) to remove the stapler unit cover (2).



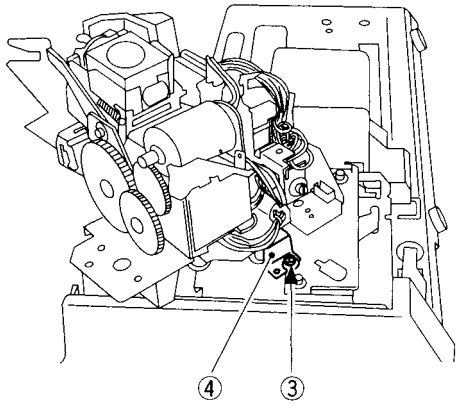
5. Stapler direction changing unit

A. Removing the stapler direction changing unit

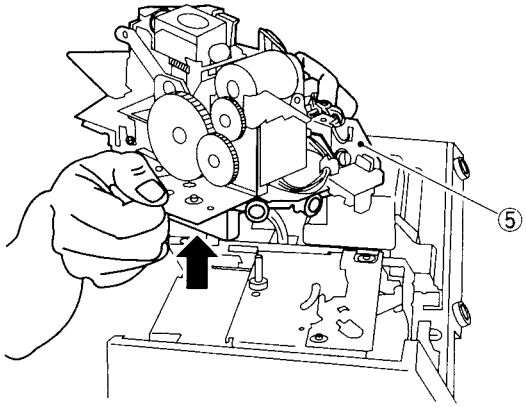
1) Remove the stapler shift unit.
2) Remove the screws (1) (2 pcs.) to remove the stapler unit cover (2).



3) Remove the screw (3) (1 pc.) to remove the stopper (4).

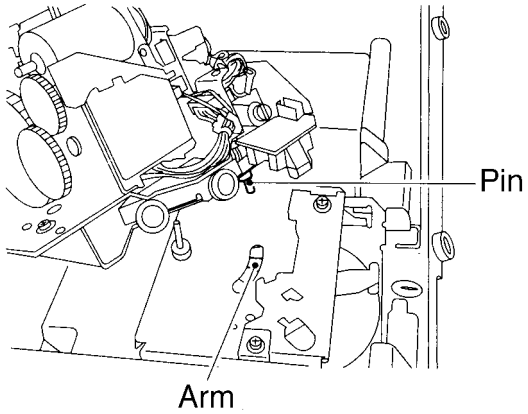


4) Raise the stapler unit to remove it.



Caution

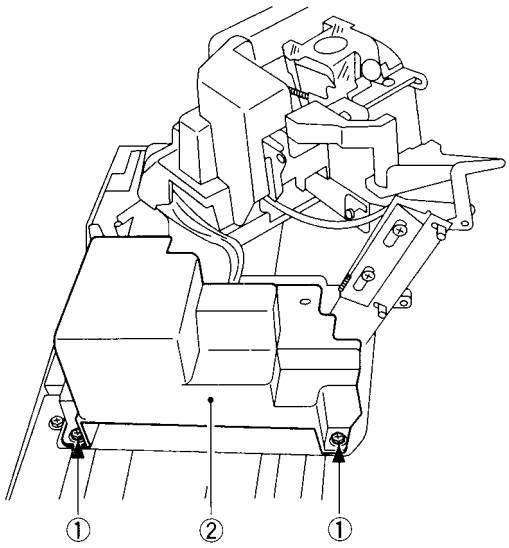
When installing the stapler unit, make sure that the arm and the pin have been connected correctly.



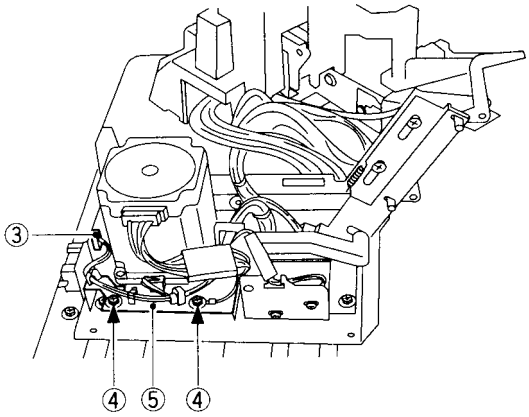
6. Stapler rocking unit

A. Removing the stapler unit rocking motor (M4)

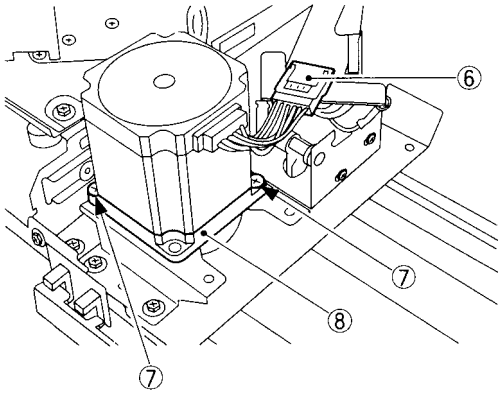
1) Remove the stapler shift unit.
2) Remove the screws (1) (2 pcs.) to remove the motor cover (2)



3) Remove the connector (3) and screws (4) (2 pcs.) to remove the sensor stand (5).

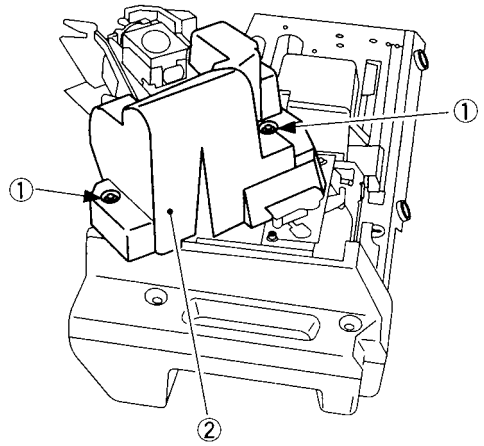


4) Remove the connector (6) and screws (7) (2 pcs.) to remove the stapler unit rocking motor (8).

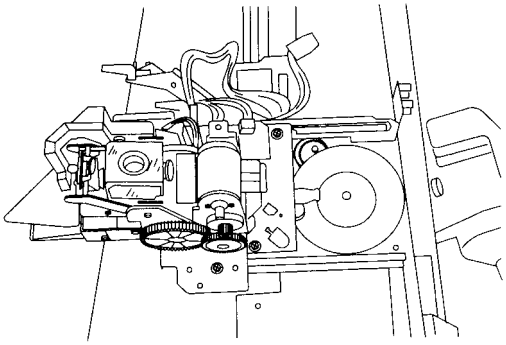


B. Removing the stapler rocking unit

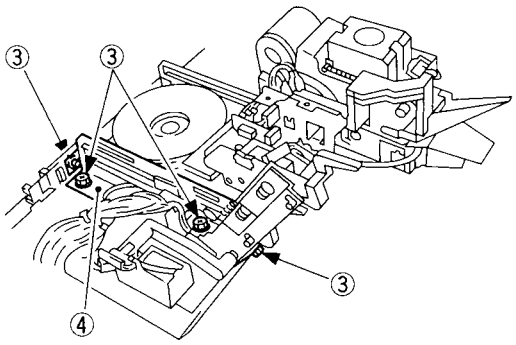
1) Remove the stapler shift unit.
2) Remove the screws (1) (2 pcs.) to remove the stapler unit cover (2).



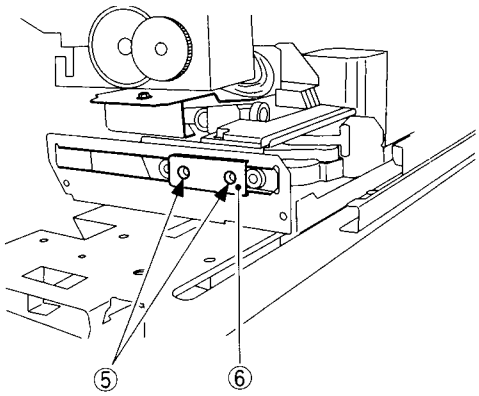
3) Remove the stapler rocking motor.
4) Rock the stapler to shift it to the stapling position.



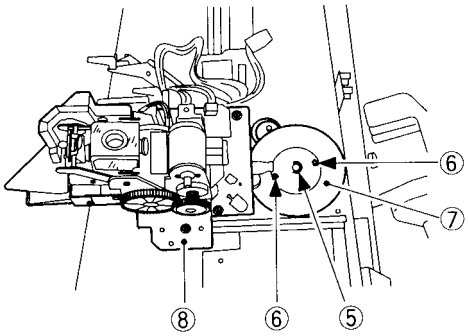
5) Remove the screws (3) (4 pcs.) to remove the rear rail (4).



6) Remove the screws (5) (2 pcs.) to remove the rail guide (5).



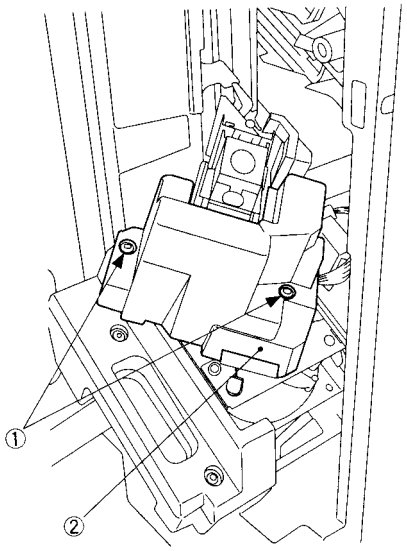
7) Remove the E-ring (5), remove two pawls (6), and remove the rocking disk (7) and stapler unit stand (8).



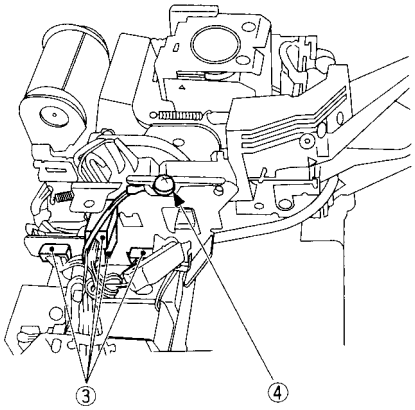
7. Stapler unit

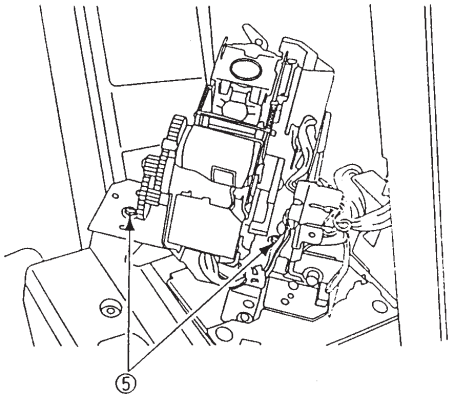
A. Removing the stapler unit

1) Open the front door to withdraw the stapler unit toward the front side.
2) Remove the screws (1) (2 pcs.) to remove the stapler unit cover (2).



3) Remove the 4 connectors (3), earth wire (4) and screws (5) (2 pcs.) to remove the stapler unit.



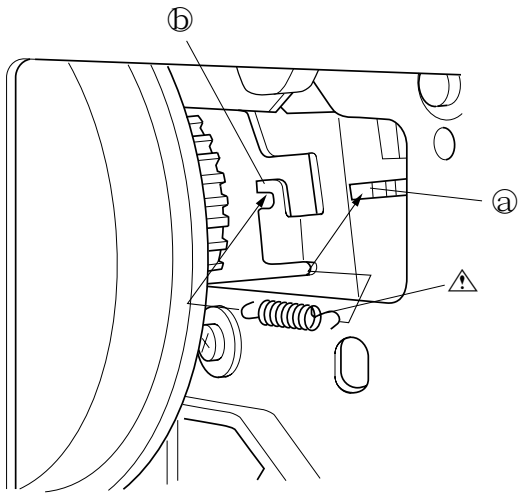


8. Others

A. Engaging the intermediate guide spring

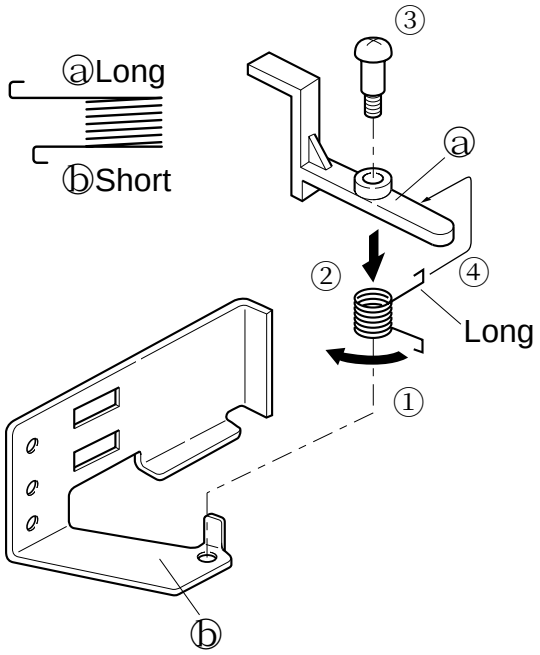
Engage the intermediate guide spring with the intermediate guide "a" and the fixed guide "b".

⚠ Do not engage with the long hook of spring.



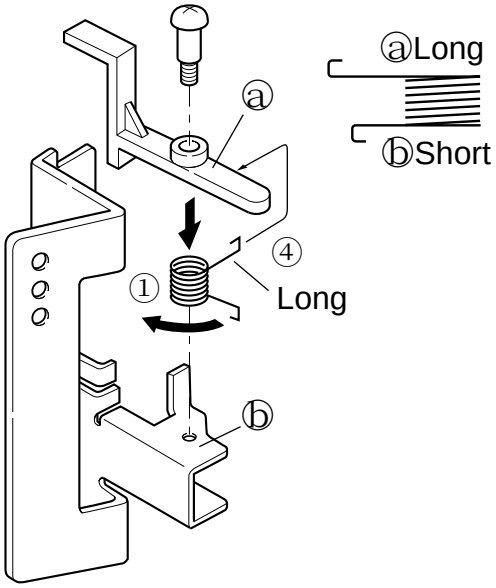
B. Fitting the non-sort sensor spring

1) Engage the sensor return spring with the sensor stand "b"
   (engage the short hook of spring).
2) Fit the sensor lever to the sensor return spring.
3) Fix the sensor lever with the M 3-step screw.
4) Engage the sensor return spring with the lever "a" (engage the long hook of spring).



C. Fitting the sort sensor spring

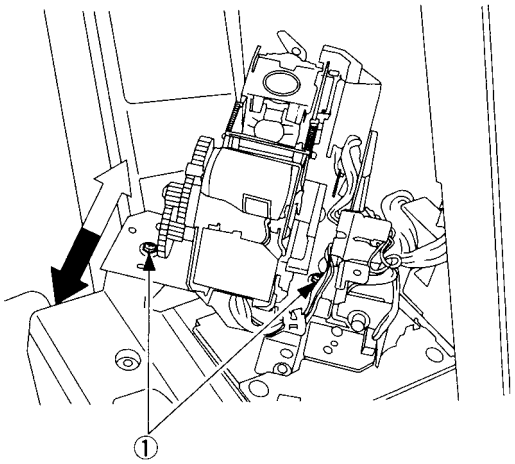
1) Engage the sensor return spring with the sensor stand "b" (engage the short hook of spring).
4) Engage the sensor return spring with the lever "a" (engage the long hook of spring).



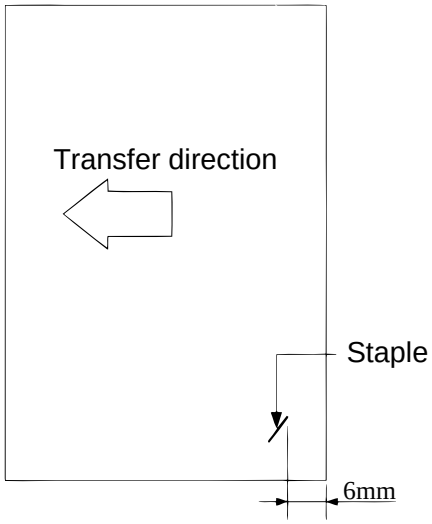
[5] Adjustment

A. Adjusting the staple position

1) Loosen the stapler unit fixing screws (1) (2 pcs.), and move the stapler unit in the arrow direction to adjust its position.



2) The position must be adjusted so that the staple is located as shown below when the corner is stapled.



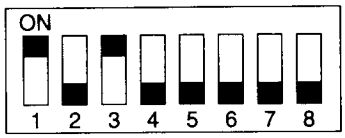
B. Adjusting the sensitivity of in-bin paper sensor

Adjust the sensitivity when the following parts have been replaced.

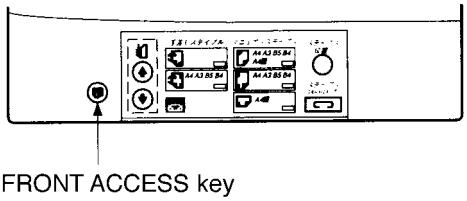
- Sorter controller PWB
- In-bin paper sensor (S3, S4/S6, S7)
- Bin unit control PWB

Procedure

1) Remove all the papers in the bin.
2) Remove the sorter controller cover, and set the dip switches (DIP SW1) provided on the sorter controller PWB as follows.



3) Set the power switch to ON.
4) Press the FRONT ACCESS key provided on the control panel of the machine.



5) Check how the FRONT ACCESS key provided on the control panel of the machine lights.
   Lighting: Completion of adjustment
   Blinking: Adjustment failure
6) When the FRONT ACCESS key blinks, turn off and on the power switch of the copying machine, then check the installation state of in-bin paper sensors (light emitting side and light receiving side), and redo the adjustment, beginning with the Step 1).
7) After completion of adjustment restore the dip switches (DIP SW1) provided on the sorter controller PWB to their original positions.

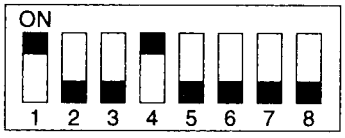
C. Adjusting the sensitivity of in-stapler paper sensor (S5)

Adjust the sensitivity when the following parts have been replaced.

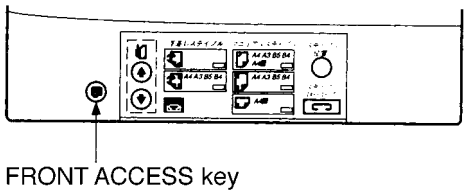
- Sorter controller PWB
- In-stapler paper sensor (S5)
- Stapler unit

Procedure

1) Remove all the papers in the stapler.
2) Remove the sorter controller cover, and set the dip switches (DIP SW1) provided on the sorter controller PWB as follows.



3) Set the power switch to ON.
4) Press the FRONT ACCESS key provided on the control panel of the machine.



5) Check how the FRONT ACCESS key provided on the control panel of the machine lights.
   - Lighting: Completion of adjustment
   - Blinking: Adjustment failure
6) If the FRONT ACCESS key blinks, turn off and on the power switch of the copying machine, and check the installation state of in-stapler paper sensor, and then redo the adjustment, beginning with Step 1).
7) After completion of adjustment restore the DIP switches (DIP SW1) to their original positions.

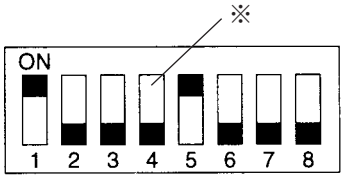
D. Adjusting the guide bar rocking area

Adjust the rocking area when the following parts have been replaced.

- Sorter controller PWB
- Guide bar home position sensor (PI16)
- Guide bar rocking motor (M8)

Procedure

1) Prepare about 10 sheets of A4 size (11x8½) paper.
2) Remove all the papers from the bin.
3) Remove the sorter controller cover, and set the dip switches (DIP SW1) provided on the sorter controller PWB as follows.

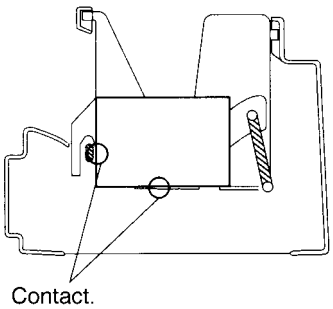


(For A4 size papers)

※ For 11 x 8 1/2 size papers, set the dip switch 4 to ON.

4) Set the power switch to ON.
5) Press the STAPLING START/STOP key provided on the control panel of the machine.
   - After the push bar returns to its home position, it moves to the A4 arrangement position.
   - The multi-guide, reference wall and guide bar move to the home position.
   - After completion of all theses operations the STAPLING START/STOP key lights.
6) Put on A4 size papers (about 10 sheets) as shown below.

   Paper must contact the bin edge and reference wall.

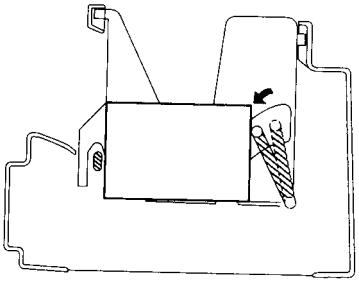


7) Press the bin shift key (UP/DOWN key), and move the bin until the guide bar contacts the papers.
   - 1st pressing of UP key: Shift in narrowing direction for 50 pulses

     2nd and subsequent pressing

     :Once pressing results in movement in narrowing direction for one pulse. If the key is kept pressed, continuous shift takes place.
   - DOWN key : Once pressing results in shift in widening direction for 1 pulse.

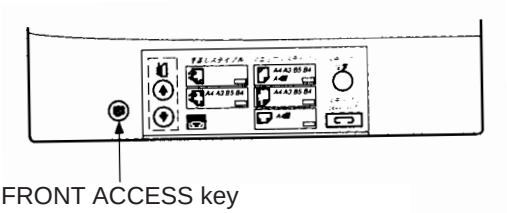
Note : When making the papers contact the guide bar, provide an allowance for the sheet spring, so as to prevent excessively tight contact.



8) Holding the sate obtained in Step 7), press the FRONT ACCESS key of control panel.
9) Check how the FRONT ACCESS key provided on the control panel lights.

   Lighting : Completion of adjustment→→→Restore the dip switches to their original position (all OFF). Thereby, adjustment has been completed.

   Blinking : Adjustment failure→→→Check the installation state of guide bar home position sensor, and redo adjustment, beginning with Step 4).



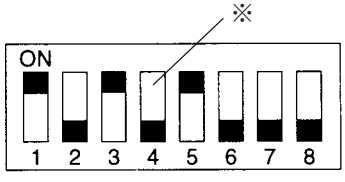
E. Adjusting the auxiliary reference wall

Adjust the auxiliary reference wall when the following parts have been replaced.

- Sorter controller PWB
- Reference wall home position sensor (PI13)
- Reference wall motor (M6)

Procedure

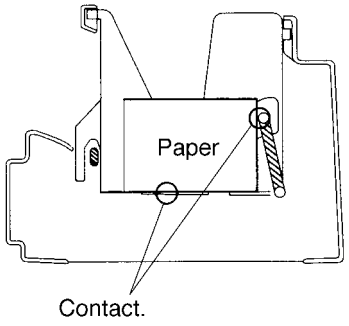
1) Prepare about 10 sheets of A4 paper.
2) Remove all the papers from the bin.
3) Remove the sorter controller cover, and set the dip switches (DIP SW1) provided on the sorter controller PWB as follows.



(For A4 size paper)

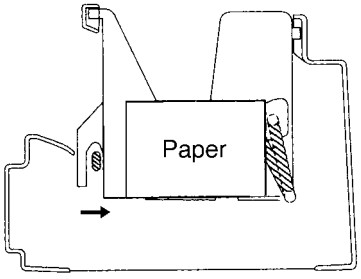
※ For 11 x 8½ size papers, set the dip switch 4 to ON.

4) Set the power switch to ON.
5) Press the STAPLING START/STOP key provided on the control panel of the machine.
   • The guide bar shifts for 18 mm from the home position.
   • After completion of all operations stated above the STAPLING START/STOP key lights.
6) Put A4 size (11 x 8½) papers (about 10 sheets) in the bin as shown below. The papers must contact the guide bar and bin edge.

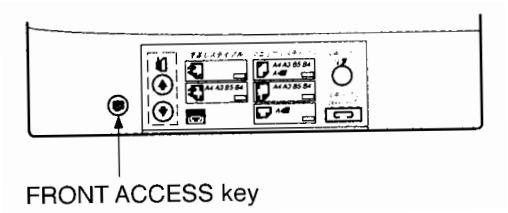


7) Press the bin shift key (UP/DOWN key) to shift the bin until the reference wall contacts the papers.
   • 1st pressing of UP key : Shift in the narrowing direction for 15 pulses
   2nd and subsequent pressing
   : Once pressing results in shift in narrowing direction for one pulse, holding down results in continuous shift
   • DOWN key : Once pressing results in shift in widening direction for one pulse.

Note: Take care so that excessive narrowing or widening does not occur.



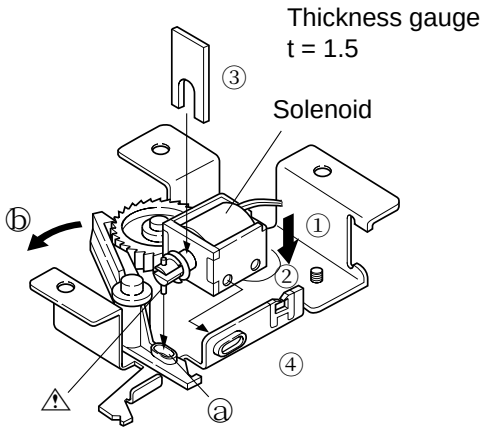
8) Holding the state described in Step 7), press the FRONT ACCESS key of control panel.
9) Check how the FRONT ACCESS key of control panel lights.
   Lighting : Completion of adjustment→→→Restore the dip switches to their original position (all OFF). Thereby, adjustment has been completed.
   Blinking : Adjustment failure→→→Check the installation state of reference wall home position sensor, and redo adjustment, beginning with Step 4).



F. Adjusting the move motor unit slide lock solenoid

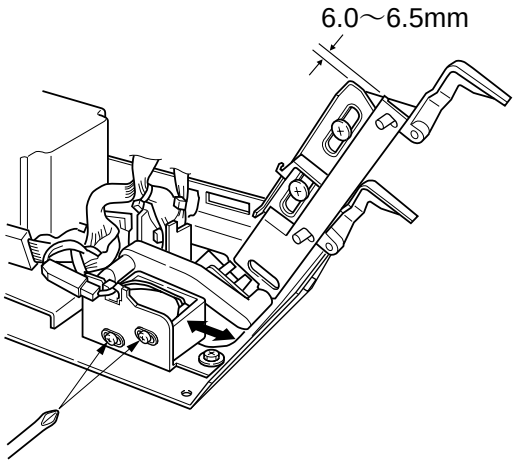
1. Fit the pin of slide solenoid (1) into the part "a".
2. Insert the spacer (3) between the iron core and the solenoid, and fully shift it toward the lock lever part "b".
3. Fix the slide solenoid (4) with screw.

⚠ The longer side of solenoid pin must be at lower side.



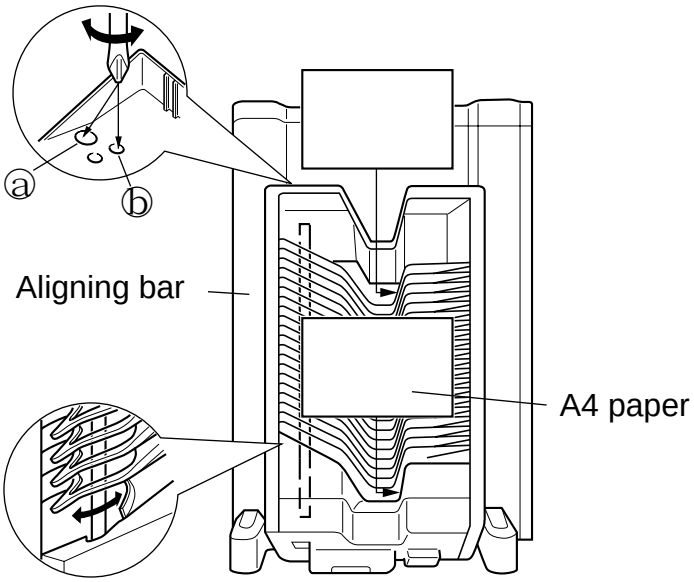
G. Adjusting the paper holder arm stop position

Arrange and fix the solenoid with screw so that the front end of flapper exists in the range A to B shown in the figure when the solenoid is on.



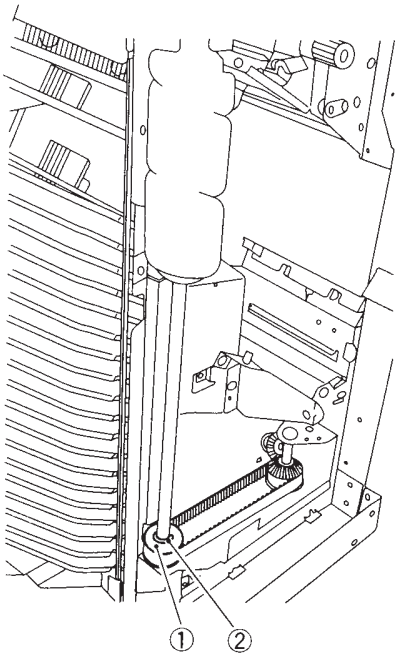
H. Adjusting the parallelism of bin unit aligning bar

1. Put A4 papers (about 10 sheets) into the upper limit and lower limit trays in contact with the reference bar.
2. Insert the screwdriver through the holes "a" and "b" of non-sort bin, and loosen the screws (2 pcs.).
3. Keep the aligning bar pressed against the adjusting plate with your fingers.
4. Insert the screwdriver through the hole "b" of non-sort bin, and tighten the screw.
5. Insert the screwdriver through the hole "b" of non-sort bin, and tighten the screw.
6. Pull the lower side of aligning bar, press it again against the adjusting plate, and make sure that the upper side and lower side contact at the same time.
7. Pull out paper.

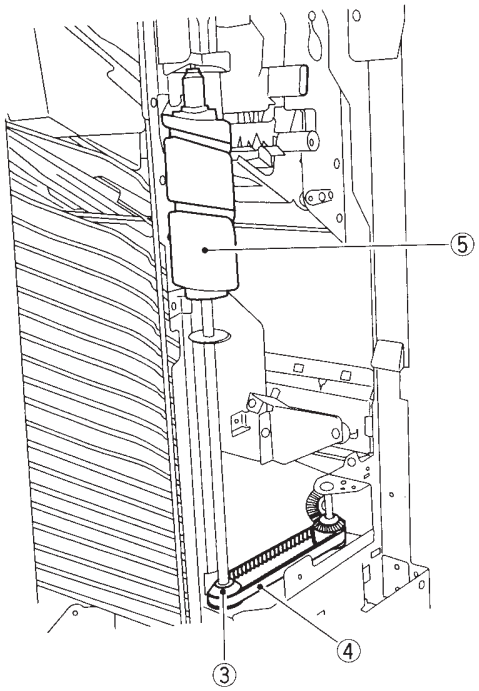


I. Adjusting the lead cam position

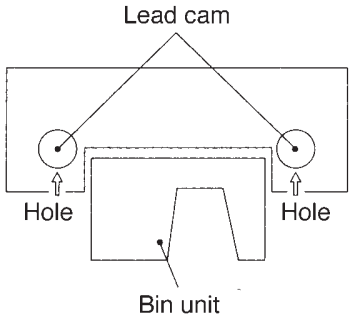
1) Remove the E-ring (2), and remove the flange (1) of lead cam shaft gear at the front side.



2) Remove the belt (4) from the gear (3), and turn the lead cam (5) to align the position of front lead cam with the rear lead cam.



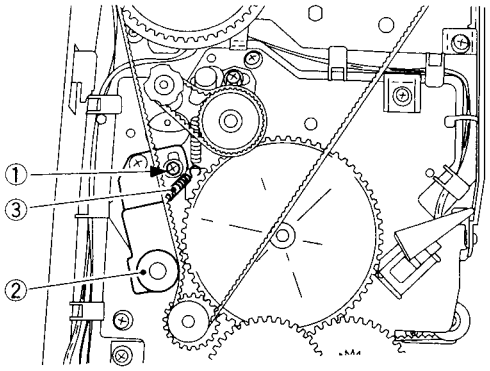
3) Set the hole position of two lead cams as shown below.



4) Holding the state of Step 3) above, put the belt (4) on the gear, return the flange (1) to its original position, and fix it with the E-ring (2).

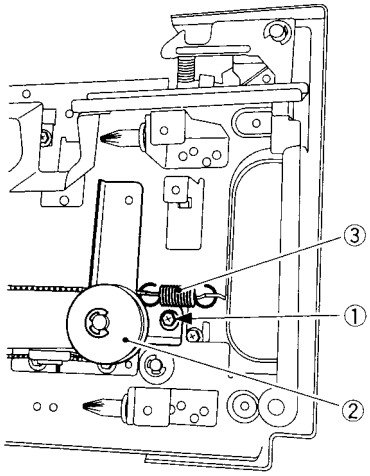
J. Adjusting the tensioner

1) Loosen the tensioner fixing screw (1), and then tighten the tensioner fixing screw (1) in the position where the tensioner 2 (2) is stopped by the tension of spring (3).



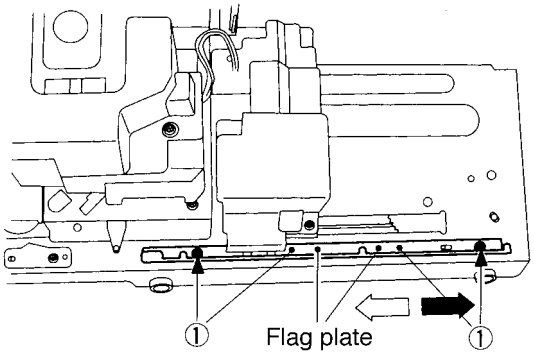
K. Adjusting the tension of stapler unit shift drive belt

1) Loosen the tensioner fixing screw (1), and then tighten the tensioner fixing screw (1) in the place where the tensioner (2) is stopped by the tension of spring (3).



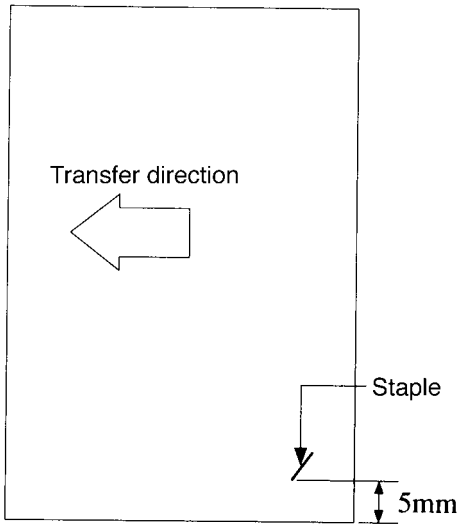
L. Adjusting the stapler unit home position

1) Loosen the two screws (1), and move ahead the flag plate to adjust the home position of stapler unit.



(Before removing the flag plate mark the fixing position.)

2) Make an adjustment so that the staple is located as shown below when corner stapling is performed.



M. CURLED PAPER ADJUSTING METHOD

1. Purpose

This adjustment is intended to remove the loading trouble caused by significant curl of paper unloaded from the PPC.

2. Dimension of adjusting jig

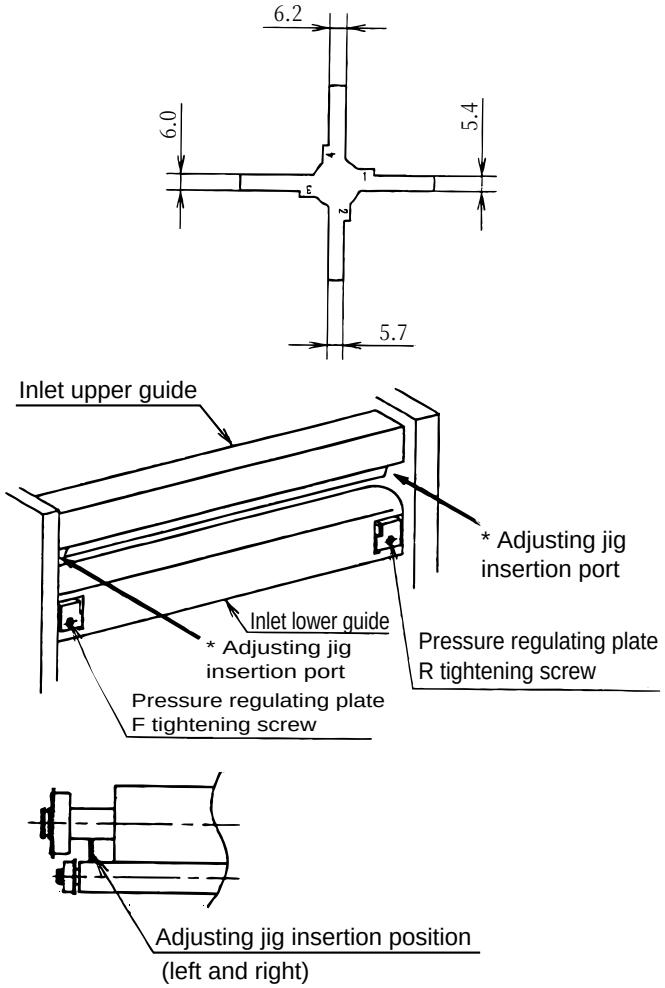
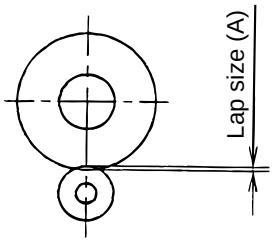


Figure 1

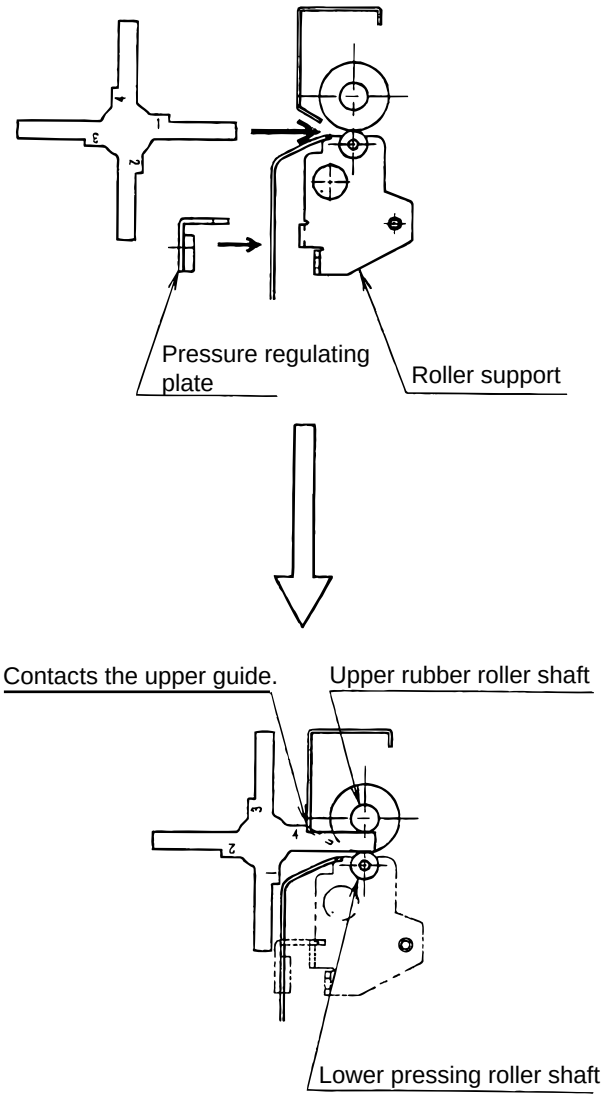
3. Dimensions

Adjusting jig stamp mark	Adjusting jig dimension	Roller lap size (A)
5.4	5.4	0.6
5.7	5.7	0.3 ※Standard (Default)
6.0	6.0	0
6.2	6.2	——

(Standard: Before shipping)



4. Pressure adjusting method (see Figure 1)



Adjusting method::1. Loosen the pressure regulating plates (F and R) tightening screws.

2. Insert the adjusting jig between the roller shafts as shown in the figure above (upper guide front aide and rear side notch).
3. Press the pressure regulating plates F and R against the internal roller support, and tighten the screw (lower).
4. Adjustment must be performed at the front and rear sides.

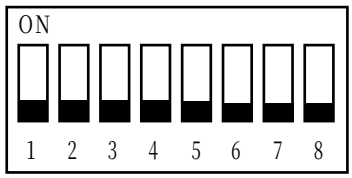
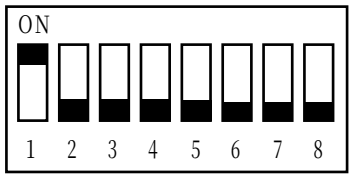
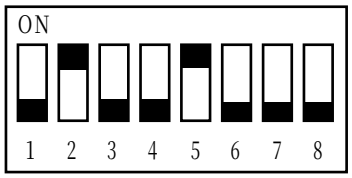
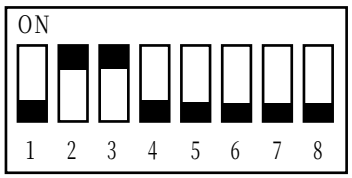
5. Adjustment of curled paper

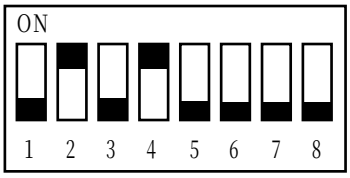
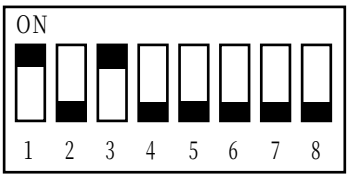
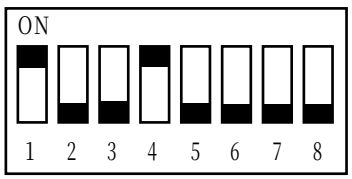
There are three stages of adjustment which vary depending on the extent of curl of paper unloaded from the PPC.

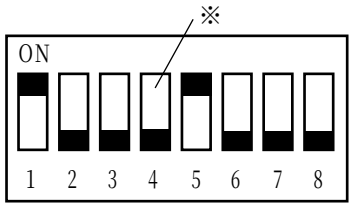
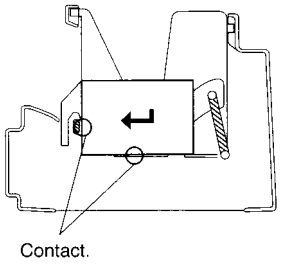
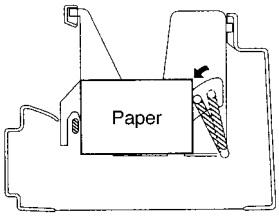
When curl is large	5.4mm
Standard	5.7mm (Default)
When wrinkles form on thin papers, etc.	6.0mm

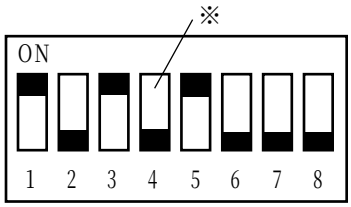
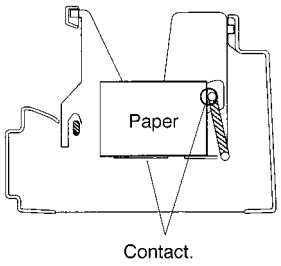
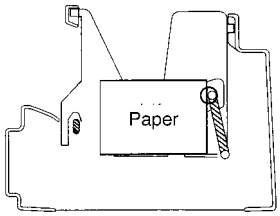
[6] Diagnostics

The dip switches (DIP SW1) provided on the sorter controller PWB afford the following diagnostic functions. Setting of dip switches can be changed while the power switch of copying machine is on.

Purpose	Setting of dip switch	Description
Normal copy mode		• To set the normal copy mode, set all the dip switches to OFF.
Transfer motor (MI) operation mode		• When the STAPLING START/STOP key is pressed, the transfer motor (MI) rotates forward (paper transfer direction). To stop it, press again the STAPLING START/STOP key. • When the FRONT ACCESS key is pressed, the transfer motor (MI) is reversed to raise the transfer guide, and then it stops. When the FRONT ACCESS key is pressed again, the transfer motor is reversed to return the transfer guide to its home position, and then it stops.
Aging mode		• When the FRONT ACCESS key is pressed, the staple sorting is repeated sequentially. When the FRONT ACCESS key is pressed again, it stops.
LED/switch check mode		When the dip switch is set to SWITCH CHECK MODE, the manual corner stapling display lights. • While the POSITION SELECTION key is held down, the manual corner stapling display goes out, and the manual double stapling display lights. • While the STAPLING START/STOP key is held down, the manual corner stapling display goes out, and the manual single stapling display lights. • While the BIN UP key is held down, the manual corner stapling display goes out, and the hand-inserted corner stapling display lights. • While the DOWN key is held down, the manual corner stapling display goes out, and the hand-inserted double stapling display lights. • While the FRONT ACCESS key is held down, the manual corner stapling display goes out, and the staple replenishment display lights.

Purpose	Setting of dip switches	Description
Backup RAM clearing		• To clear the backup RAM, press the FRONT ACCESS key. Note : After completion of backup RAM clearing perform the following operations. (1) Adjustment of in-bin paper sensor sensitivity (2) Adjustment of in-stapler paper sensor sensitivity (3) Adjustment of guide bar motor rocking range
Adjustment of in-bin paper sensor sensitivity		• To start the in-bin paper sensor adjustment mode, press the FRONT ACCESS key. This adjustment must be performed when the following parts have been replaced. • Sorter controller PWB • In-bin paper sensor • Bin unit control PWB Adjustment procedure (1) Remove all the papers from the bin. (2) Remove the sorter controller cover, and set the dip switches provided on the sorter controller PWB as shown in the figure. (3) Press the FRONT ACCESS key of control panel. (4) Check how the FRONT ACCESS key of control panel lights. Lighting : Completion of adjustment→→→Restore the initial setting (all OFF) of dip switches. Blinking: Adjustment failure→→→After turning off and on the power supply for the copying machine, check the installation state of in-bin paper sensor, and redo the adjustment, beginning with Step (1).
Adjustment of in-stapler paper sensor sensitivity		• To start the in-stapler paper sensor adjustment mode, press the FRONT ACCESS key. This adjustment must be performed when the following parts have been replaced. • Sorter controller PWB • In-stapler paper sensor • Stapler unit Adjustment procedure (1) Remove all the papers from the stapler. (2) Remove the sorter controller cover, and set the dip switches provided on the sorter controller PWB as shown in the figure. (3) Press the FRONT ACCESS key of control panel. (4) Check how the FRONT ACCESS key of control panel lights. Lighting : Completion of adjustment→→→Restore the initial setting (all OFF) of dip switches. Blinking : Adjustment failure→→→After turning off and on the power supply for the copying machine check the installation state of in-stapler paper sensor, and redo the adjustment, beginning with Step (1).

Purpose	Setting of dip switches	Description
Guide bar operation range adjustment mode	 (A4 paper) ※ For 11 x 8½ paper, set the dip switch 4 to ON.  	This adjustment must be performed when the following parts have been replaced. • Sorter controller PWB • Guide bar home position sensor • Guide bar rocking motor Adjustment procedure (1) Prepare about 10 sheets of A4 (11 x 8 ½) paper. (2) Remove all the papers from the bin. (3) Remove the sorter controller cover, and set the dip switches provided on the sorter controller PWB as shown in the figure. (4) Press the STAPLING START/STOP key of control panel. • After the push bar returns to its home position, it moves to the A4 aligning position. • The multi-guide, reference wall and guide bar move to the home position. • After completion of all these operations the STAPLING START/STOP key lights. (5) Put A4 (11 x 8½) papers (about 10 sheets) in the bin as shown in the figure, so that they contact the bin edge and reference wall. (6) Press the bin shift key (UP/DOWN key) to shift the guide bar until it contacts the papers. • First pressing of UP key : Shift in narrowing direction for 50 pulses • 2nd and subsequent pressing :Once pressing results in shift in narrowing direction for one pulse, and holding down results in continuous shift. • DOWN key : Once pressing results in shift in widening direction for one pulse. Note : When making the guide bar contact the papers, take care so as not to cause excessive pressing, taking into account release of plate spring. (7) Holding the state of Step (6), press the FRONT ACCESS key of control panel. (8) Check how the FRONT ACCESS key of control panel lights. Lighting : Completion of adjustment→→→Restore the initial setting of dip switches (all OFF). Blinking : Adjustment failure→→→Check the installation state of guide bar home position sensor, and redo the adjustment, beginning with Step (4).

Purpose	Setting of dip switches	Description
Auxiliary reference wall adjustment mode	 (A4 paper) ※ For 11 x 8½ papers, set the dip switch 4 to ON.  	This adjustment must be performed when the following parts have been replaced. • Sorter controller PWB • Reference wall home position sensor • Reference wall motor Adjustment procedure (1) Prepare about 10 sheets of A4 (11 x 8 1/2) paper. (2) Remove all the papers from the bin. (3) Remove the sorter controller cover, and set the dip switches provided on the sorter controller PWB as shown in the figure. (4) Press the STAPLING START/STOP key of control panel. • The guide bar moves for 18 mm from the home position. • After completion of all these operations the STAPLING START/STOP key lights. (5) Put A4 (11 x 8½) papers in the bin as shown in the figure left. The papers must contact the guide bar and bin edge. (6) Press the bin shift key (UP/DOWN key) to shift the reference wall until it contacts the papers. • 1st pressing of UP key : Shift in narrowing direction for 15 pulses 2nd and subsequent pressing :Once pressing results in shifting in narrowing direction for one pulse, and holding down results in continuous shift. • DOWN key : Once pressing results in shift in widening direction for one pulse. Note: Be careful so that excessive narrowing and widening do not occur. (7) Holding the state of Step (6), press the FRONT ACCESS key of control panel. (8) Check how the FRONT ACCESS lamp of control panel lights. Lighting : Completion of adjustment→→→Restore the initial setting (all OFF) of dip switches. Blinking : Adjustment failure→→→Check the installation state of reference wall home position sensor, and redo the adjustment, beginning with Step (4).

[7] Troubleshooting

1. Paper jam

Location	Detection conditions
Transfer delay jam	When the specified time lapsed after reception of paper unloading signal, the pass sensor does not detect sheet paper.
Transfer stagnation jam	Although transfer was executed for the specified time (distance) after the pass sensor detected the sheet paper, the sheet paper did not exit from the pass sensor.
Power ON jam	At least one of pass sensors was on when power was turned on.
Door open jam	The sorter was released from the machine during transfer or the stapler door was opened.
Out-of-bin jam	The rear end of paper extended over the bin edge.

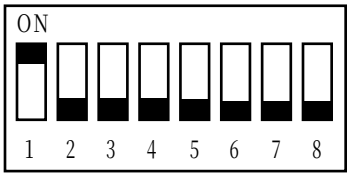
2. Trouble indication

LEDs provided on the sorter controller PWB light, blink or go out depending on status of the machine, indicating the following information.

LED No.	Lighting	Blinking	Off	Remarks
LED1		CPU is operating properly		
LED2	Malfunction of sorter controller PWB	Malfunction of sorter controller PWB	Operation stop	
LED3	The stapler unit is not in stapling enable position (home position, front side, rear side).		The stapler unit is in stapling enable position (home position, front side, rear side).	
LED4	The stapler unit shift prohibition signal is output (stapler unit shift disabled).		Stapler unit shift enabled	
LED5	The bin shift motor operation prohibition signal is output (bin shift motor operation disabled).		Bin shift motor operation enabled	
LED6	Paper holder arm location is not proper.		Paper holder arm location is proper.	
LED7	The connector of transfer guide UP sensor, transfer guide home position sensor or push bar home position sensor has been disconnected.		The connector of transfer guide UP sensor, transfer guide home position sensor or push bar home position sensor has been connected properly.	
LED8	Normal rotation of transfer motor	Change of rotational speed of transfer motor	Transfer motor rotation stop or irregular rotation	
LED9	The connector of sort paper sensor or non-sort paper sensor has been disconnected.		The connector of sort paper sensor or non-sort paper sensor has been connected properly.	
LED10	The connector of stapler unit direction sensor or stapler unit shift position sensor has been disconnected.		The connector of stapler unit direction sensor or stapler unit shift position sensor has been connected properly.	
LED11	The stapler unit rocking motor cannot run.		The stapler unit rocking motor can run.	

3. Corrective actions against troubles

A Transfer motor errors

Causes/Defective parts	Step	Checking	Results	Corrective action
	1	Set the dip switches (DIPSW1) provided on the sorter controller PWB as shown below.  When the FRONT ACCESS key is pressed, the transfer motor (MI) is reversed. (To stop, press again the STAPLING START/STOP key.)	YES	Check, beginning with Step 4.
Transfer motor (MI)	2	Set the tester to the x1 ohm range. Disconnect the connector (J10) provided on the sorter controller PWB. Check that the resistance between bundle wire side J10-1 and -2 is about several ohms.	NO	Check the wiring to the transfer motor. If it is normal, replace the transfer motor.
Transfer motor clock sensor (P15)	3	Set the tester to the 10VDC range. After turning the transfer motor by hand check that voltage between the connectors 15-3(+) and J5-2(-) provided on the sorter controller PWB changes alternately to 0V and 5V.	NO	Replace the transfer motor clock sensor (PI5).
Sorter controller PWB			YES	Replace the sorter controller PWB.

B **Push bar motor error**

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the sorter controller PWB and the bin unit control PWB has been connected correctly.	NO	Connect correctly.
Circuit breaker	2	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	3	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	4	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Push bar motor (M7)	5	Check that pulse output is obtained at the connectors J306-3 to 6 provided on the bin unit control PWB with push bar motor operation timing. Check also that +24V is obtained on J306-1,2.	YES	Check the wiring to the push bar motor. If it is normal, replace the push bar motor.
Bin unit control PWB	6	Check whether normal operation is restored by replacing the bin unit control PWB.	YES	Replace the bin unit control PWB.
Sorter controller PWB			YES	Replace the sorter controller PWB.

C Reference wall motor error

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the sorter controller PWB and the bin unit control PWB has been connected correctly.	NO	Connect correctly.
Circuit breaker	2	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	3	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	4	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Reference wall motor(M6)	5	Check that pulse output is obtained at the connectors J304-7 to 10 provided on the bin unit control PWB with reference wall motor operation timing. Check also that +24V is obtained on J304-6 in operating state and +5V in nonoperating state.	YES	Check the wiring to the reference wall motor. If it is normal, replace the reference wall motor.
Bin unit control PWB	6	Check whether normal operation is restored by replacing the bin unit control PWB.	YES	Replace the bin unit control PWB.
Sorter controller PWB			NO	Replace the sorter controller PWB.

D Multi-guide motor error

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the sorter controller PWB and the bin unit control PWB has been connected correctly.	NO	Connect correctly.
Circuit breaker	2	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	3	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	4	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Multi-guide motor (M6)	5	Check that pulse output is obtained at the connectors J304-2 to 5 provided on the bin unit control PWB with multi-guide motor operation timing. Check also that +24V is obtained on J304-1 in operating state and +5 V in nonoperating state.	YES	Check the wiring to the multi-guide motor. If it is normal, replace the multi-guide motor.
Bin unit control PWB	6	Check whether normal operation is restored by replacing the bin unit control PWB.	YES	Replace the bin unit control PWB.
Sorter controller PWB			NO	Replace the sorter controller PWB.

E **In-bin paper sensor error**

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the sorter controller PWB and the bin unit control PWB has been connected correctly.	NO	Connect correctly.
Cable	2	Check that the cables of in-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7) have been correctly connected to the bin unit control PWB. (Connector J302)	NO	Correctly connect.
Installation of in-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7)	3	Check that the in-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7) have been installed normally.	NO	Correctly install. If the in-bin paper sensor light emitting side (S3/S6) or light receiving side (S4/S7) has been re-installed, adjust the in-bin paper sensor sensitivity.
In-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7)	4	Check whether normal state can be restored by replacing the in-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7) and subsequently adjusting the sensitivity of in-bin paper sensor.	YES	Replace the in-bin paper sensor light emitting side (S3/S6) and light receiving side (S4/S7), and adjust the sensitivity of in-bin paper sensor.
Bin unit control PWB	5	Check whether the normal state can be restored by replacing the bin unit control PWB and subsequently adjusting the sensitivity of in-bin paper sensor.	YES	Replace the bin unit control PWB, and adjust the sensitivity of in-bin paper sensor.
Sorter controller PWB			NO	Replace the sorter controller PWB, and adjust the sensitivity of in-bin paper sensor.

F **Guide bar motor error**

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the sorter controller PWB and the bin unit control PWB has been connected correctly.	NO	Connect correctly.
Circuit breaker	2	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	3	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	4	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Guide bar motor (M6)	5	Check that pulse output is obtained at the connectors J307-3 to 6 provided on the bin unit control PWB with guide bar motor operation timing.	YES	Check the wiring to the guide bar motor. If it is normal, replace the guide bar motor. Check that +24V is obtained on J307-1,2.
Bin unit control PWB	6	Check whether normal operation is restored by replacing the bin unit control PWB.	YES	Replace the bin unit control PWB.
Sorter controller PWB			NO	Replace the sorter controller PWB.

G Stapler unit rocking motor error

Causes/Defective parts	Step	Checking	Results	Corrective action
Circuit breaker	1	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	2	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	3	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Stapler unit rocking motor (M4)	4	Check that pulse output is obtained at the connectors J16-5 to 8 provided on the sorter controller PWB with stapler unit rocking motor operation timing. Check also that +24V is obtained on J16-3,4.	YES	Check the wiring to the stapler unit rocking motor. If it is normal, replace the stapler unit rocking motor.
Stapler unit rocking motor clock sensor (P18)	5	Set the tester to the 10VDC range. Check that voltage between J6-14(+) and J6-13(-) provided on the sorter controller PWB changes alternately to 0V and 5V when the stapler unit rocking motor is turned by hand.	NO	Replace the stapler unit rocking motor clock sensor (P18).
Stapler unit rocking motor home position sensor (P19)	6	Set the tester to the 10VDC range. Check whether voltage between J6-11(+) and J6-10(-) provided on the sorter controller PWB is about 5V when the stapler unit rocking motor home position sensor (PI9) is shielded or about 0 V when the sensor is not shielded.	NO	Stapler unit rocking motor home position sensor (PI9)
Sorter controller PWB			YES	Replace the sorter controller PWB.

H **Stapler unit shift motor error**

Causes/Defective parts	Step	Checking	Results	Corrective action
Circuit breaker	1	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	2	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J-3(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
	3	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check 24V power supply for the copying machine.
Stapler unit shift motor (M3)	4	Check that pulse output is obtained at the connectors J7-10 to 13 provided on the bin sorter controller PWB with stapler unit shift motor operation timing. Check also that +24V is obtained on J7-9.	YES	Check the wiring to the stapler unit shift motor. If it is normal, replace the stapler unit shift motor.
Sorter controller PWB			NO	Replace the sorter controller PWB.

I In-stapler paper sensor error

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable of in-stapler paper sensor (S5) has been connected correctly to the sorter controller PWB. (Connector J14-6,7,8)	NO	Connect correctly.
Installation of in-stapler paper sensor (S5)	2	Check that the installation of in-stapler paper sensor is normal.	NO	Correctly install.
In-stapler paper sensor (S5)	3	Check whether the normal state is restored by replacing the in-stapler paper sensor (S5) and subsequently adjusting the sensitivity of in-stapler paper sensor.	YES	If the in-stapler paper sensor (S5) has been re-installed, adjust the sensitivity of in-stapler paper sensor. Replace the in-stapler paper sensor (S5), and adjust sensitivity of in-stapler paper sensor.
Sorter controller PWB			NO	Replace the sorter controller PWB, and adjust the sensitivity of in-stapler paper sensor.

J Bin shift motor error

Causes/Defective parts	Step	Checking	Results	Corrective action
Cable	1	Check that the cable between the bin shift motor driver PWB and the sorter controller PWB has been connected correctly.	NO	Connect correctly.
Circuit breaker	2	Check that the circuit breaker (CB1) provided on the sorter controller PWB is operative.	YES	After removing the cause of actuation of circuit breaker press the circuit breaker.
24V power supply failure	3	Set the tester to the 50VDC range. Check that voltage between J1-4(+) and J1-3(-) provided on the sorter controller PWB is about 24V.	NO	Check the 24V power supply for the copying machine.
	4	Check that voltage between J2-2(+) and J2-1(-) provided on the sorter controller PWB is about 24V.	NO	Check the 24V power supply for the copying machine.
Bin shift motor (M9)	5	Check that pulse output is obtained at the connectors J602-2 to 6 provided on the bin shift driver PWB with bin shift motor (M9) operation timing. Check also that +24V is obtained on J602-1,2.	NO	Check the wiring to the bin shift motor. If it is normal, replace the bin shift motor.
Bin shift motor driver PWB	6	Check whether normal operation is restored by replacing the bin shift motor driver PWB.	YES	Replace the bin shift motor driver.
Sorter controller PWB			NO	Replace the sorter controller PWB.

[8] Maintenance

1. Maintenance list

△ : Cleaning ● : Replacement × : Lubricating

No	Part code	Part name	100,000 sheets	200,000 sheets	500,000 sheets	1,000,000 sheets	Remarks
1		Sensors	△ (Adjustment)				Clean after every 100,000 sheets of treatment
2	0GZFB30100000	Lead cam (front)	×				Lubricate after every 100,000 sheets of treatment
3	0GZFB30101000	Lead cam (rear)	×				Lubricate after every 100,000 sheets of treatment
4	0GZ4A11211000	Staple unit		●			As a reference
5	0GZFB30099000	Destaticizing brush 3				●	As a reference
6	0GZFB37812000	Destaticizing brush 4				●	As a reference
7	0GZFB34200000	Destaticizing brush 5				●	As a reference

[9] Operation

1. Outline

The machine performs sorting of papers unloaded from the copying machine, stapling and front access according to the operation mode set on the copying machine.

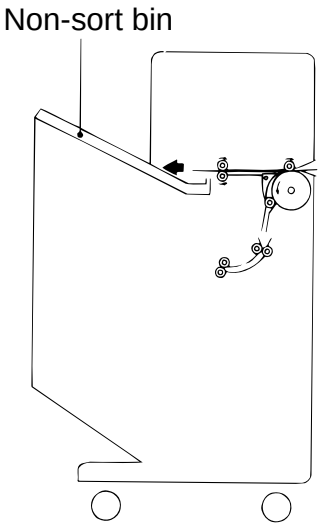
The machine performs also stapling of unloaded papers and front access to them according to key operations of control panel of the machine.

The main available operation modes are the following 6.

1. NON-SORT mode
2. SORT mode
3. GROUP mode
4. STAPLE SORT mode
5. FRONT ACCESS mode
6. MULTI-STACKING mode

A. NON-SORT mode

Papers are unloaded into the non-sort bin. In this mode sorting is not performed.

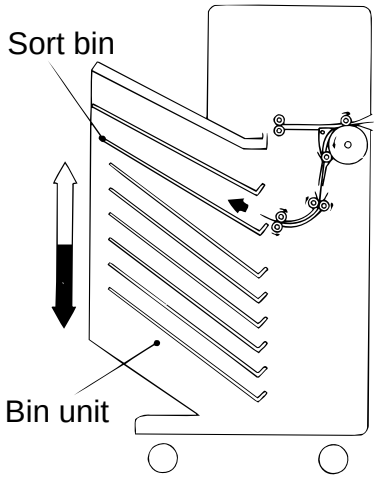


B. SORT/GROUP/STAPLE SORT mode

Papers are unloaded into the sort bin.

In this mode the bin unit moves up and down to perform sorting.

In the stapling mode the papers unloaded into the specific bin are stapled.

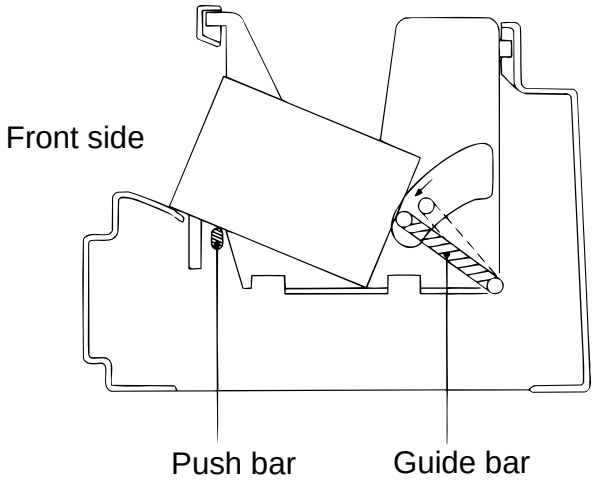


C. FRONT ACCESS mode

In this mode the copies are pushed out toward the front side so that they can be taken out at the front side of machine. This mode is executed by actuating the push bar and the guide bar. When the front access is requested from the control panel of the machine (front access request from the copying machine), this mode is actuated.

This mode is valid when the following conditions are satisfied.

a. Size of unloaded copies is A4, B5 or LTR, and transverse feed is applied.
b. All the papers in all bins have the same size.
c. The number of stacked paper sheets in each bin does not exceed 50.



D. MULTI-STACKING mode

In the multi-stacking mode up to 2 paper bundles are placed in one bin when more than 21 groups are specified for sorting or stapling/sort copy.

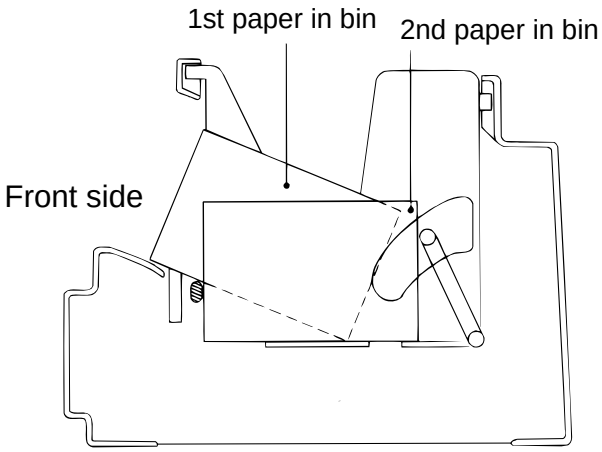
In this mode after completion of front access of 20 bins the next sorting or stapling/sort copy is performed successively.

This mode is valid when the following conditions are satisfied.

a. Size of unloaded copies is A4, B5 or LTR, and transverse feed is applied.

b. All the papers in all bins have the same size.

c. The number of stacked paper sheets in each bin does not exceed 50.



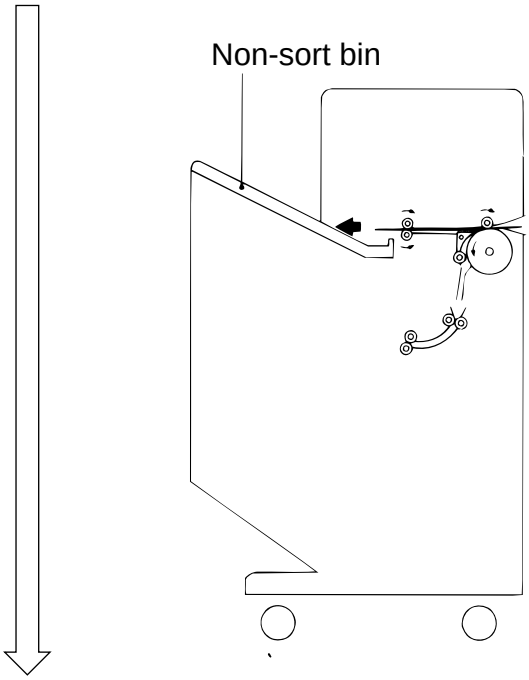
2. Basic operations

The basic operations of each mode are as follows.

A. NON-SORT mode

1) The COPY START key of copying machine is set to ON.

2) Papers are unloaded into the non-sort tray.

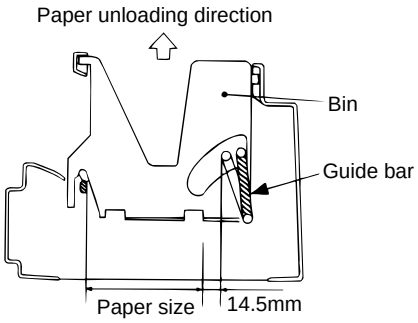


3) The specified number of papers is unloaded.
End of operation

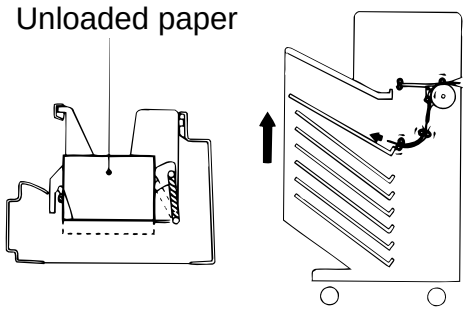
B. SORT mode

1) The COPY START key of copying machine is set to ON.

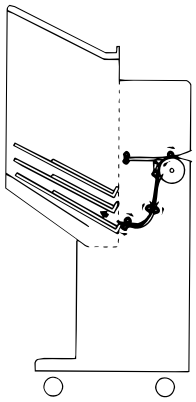
2) The guide bar moves to the position corresponding to the specific paper size.



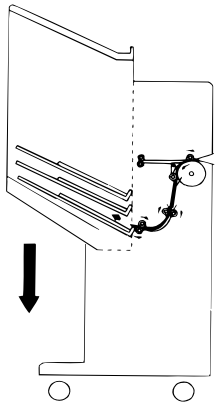
3) Whenever paper is unloaded, the guide bar rocks until the restricting plate contacts the paper to align papers. Then, one bin shift is performed.



4) The specified number of copies is made.



5) Original is changed, and reverse sort is performed.



6) Repetition as specified

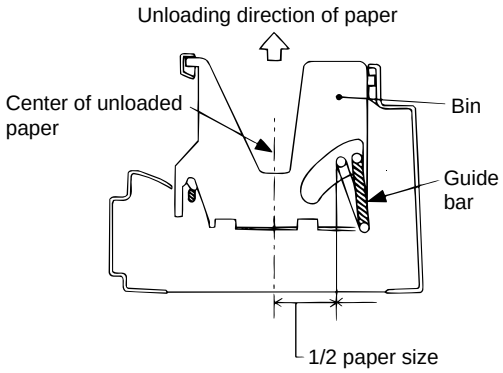
7) After completion of copy the guide bar returns to its home position.

*1: If the RADF is not used, the bin unit returns to the home position whenever the COPY START key is set to ON. Accordingly, reverse sorting is not performed.

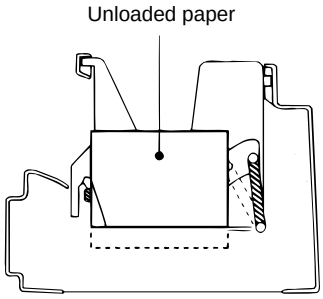
C. GROUP mode

1) The COPY START key of copying machine is set to ON.

2) The guide bar moves to the position corresponding to 1/2 paper size from the unloaded paper center.

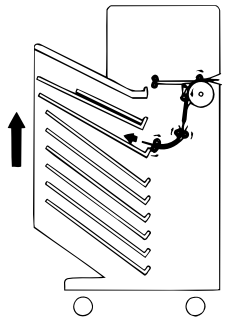


3) Whenever paper is unloaded, the guide bar rocks until the restricting plate contacts the paper edge to align papers.



4) Completion of specified number of copies

5) The original is changed, one bin shift is performed, and paper unloading is continued.

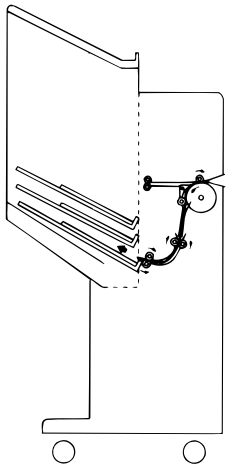


6) Repetition as specified

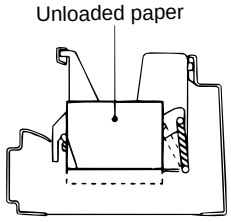
7) After completion of copy the guide bar returns to its home position.

D. STAPLE SORT mode

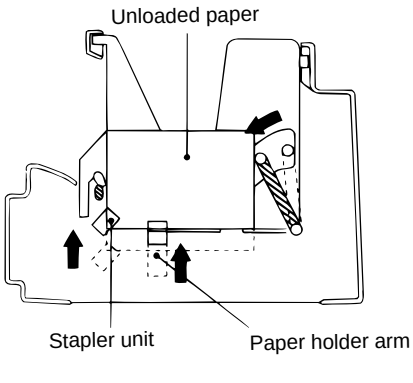
1) The same operation as that of SORT mode is performed. All the copies are unloaded into the bin.



2) The guide bar rocks three times.



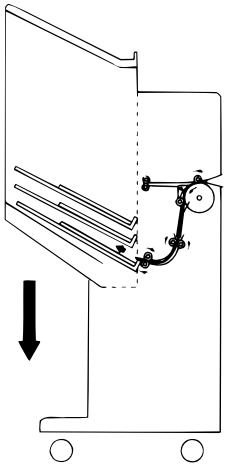
3) The guide bar aligns papers.
The paper holder arm holds papers.
The stapler unit moves to the stapling position.



4) The stapler unit staples papers.

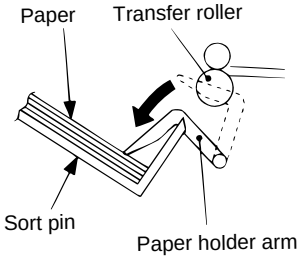
5) The guide bar, paper holder arm and stapler unit leave the papers.

6) One bin shift



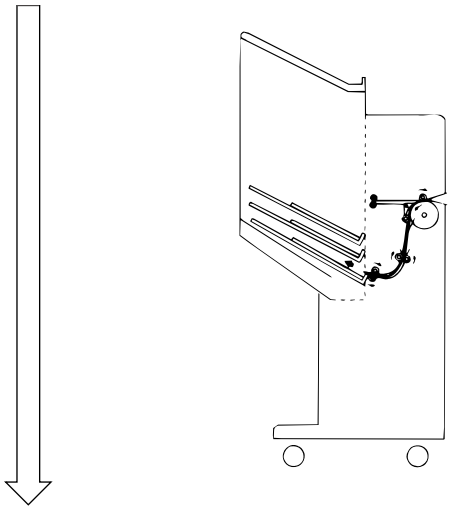
7) The operations of Step 3 to Step 6 are performed for all the papers in bins, and then operation is finished.

Note:
The STAPLE SORT mode can be set only when the RADF is used.

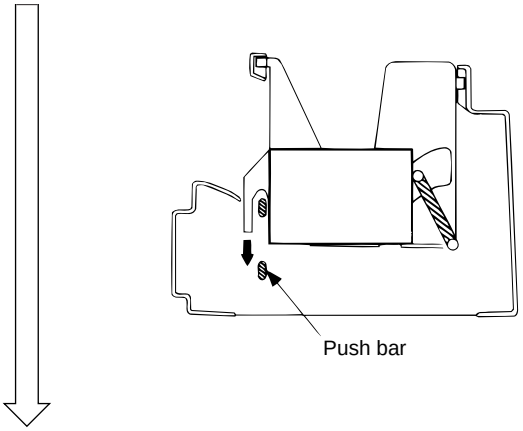


E. FRONT ACCESS mode

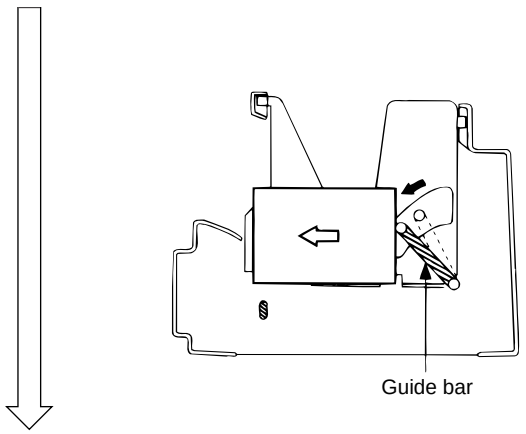
1) The same operation as that of SORT mode is performed. All the papers are unloaded into the bin.



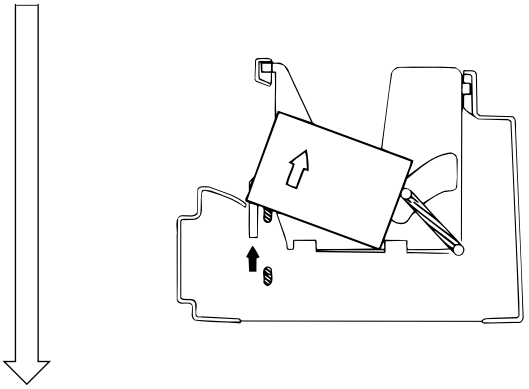
2) Before the papers are pushed up, the push bar is moved to the escape position.



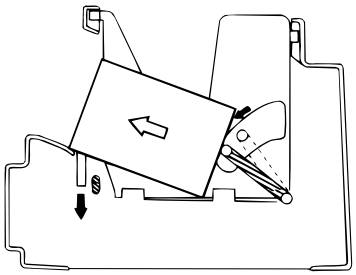
3) The guide bar arranges the papers at the front side.



4) The push bar pushes up all the papers in the bin.

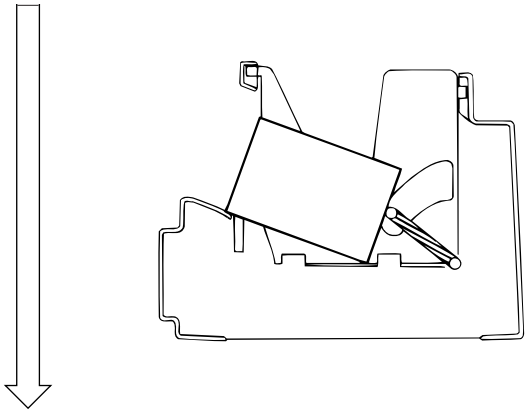


5) The guide bar pushes out toward the front side all the papers laid on the bin. At the same time the push bar moves to the push-out position.

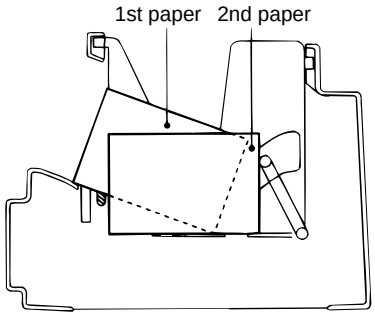


F. MULTI-STACKING mode

1) The same operation as that of FRONT ACCESS mode is performed. All the papers on 20 bins are pushed out toward the front side.



2) The same operation as that of SORT mode is performed. The papers are unloaded into the bin.



3. Operations of units

A. Transfer drive system

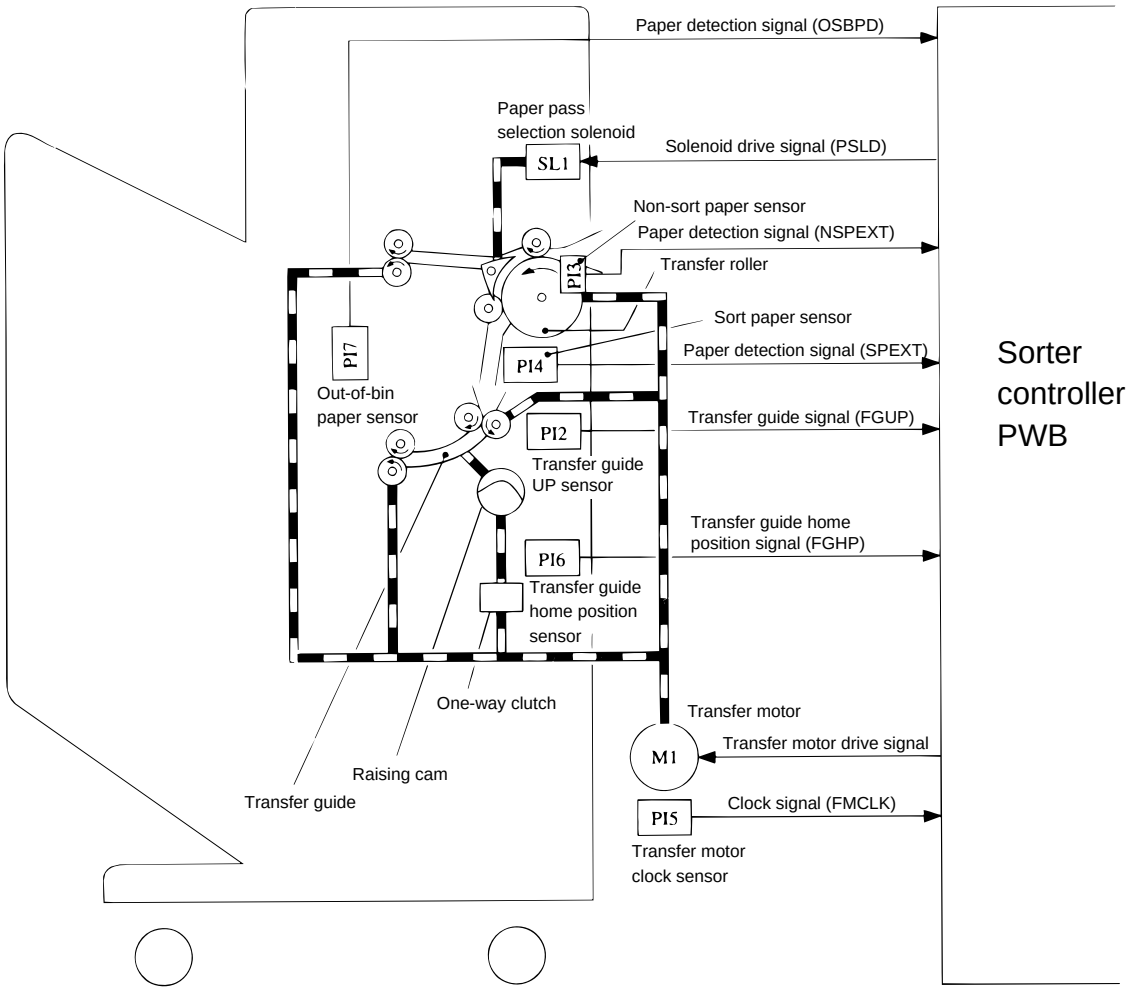
(1) Outline

The transfer system sends the papers unloaded from the copying machine to the bin, using the transfer rollers which is driven by the transfer motor (M1).

While the papers are transferred, the transfer motor (M1) rotates forward. When the transfer motor (M1) is reversed, the paper guide is raised.

The paper transfer route is changed when the paper pass solenoid (SL1) is turned on or off according to the mode which has been set on the copying machine.

In the NON-SORT mode the paper is detected by the non-sort paper sensor (PI3). In the SORT mode the paper is detected by the sort paper sensor (PI4).

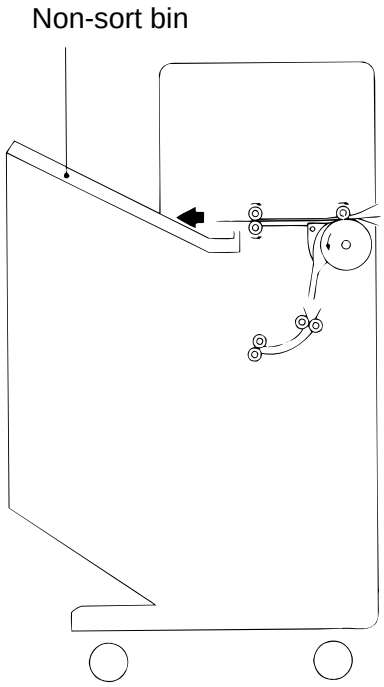


(2) Transfer route

The paper is transferred as follows.

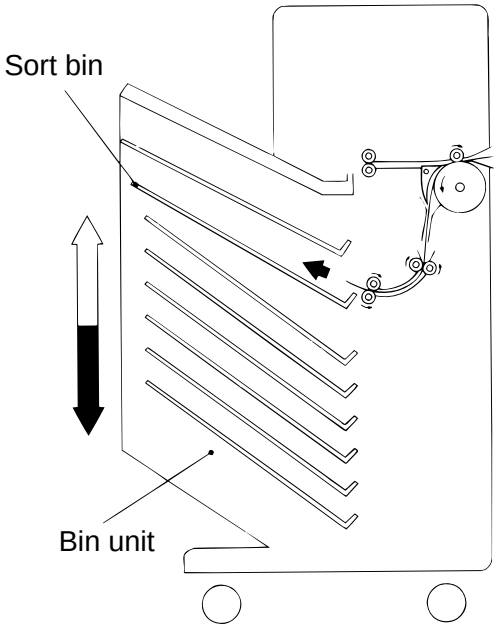
1) NON-SORT mode

In this mode the copies are unloaded into the non-sort bin.



2) SORT/GROUP/STAPLE SORT mode

In this mode the copies are unloaded into the sort bin.



(3) Transfer speed control

The transfer speed is controlled by the transfer motor (M1).

The transfer motor controls the following speeds, changing the rotational speed of transfer roller.

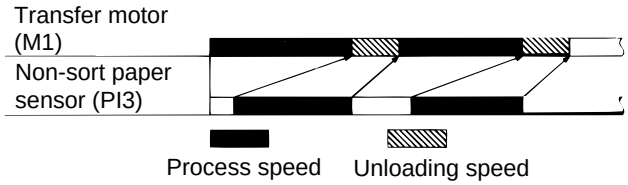
1) Process speed

The papers are transferred with the speed equal to the process speed of copying machine.

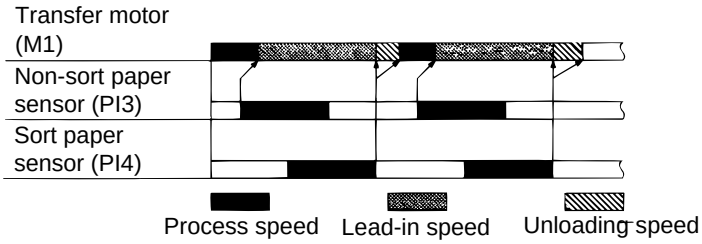
2) Leading-in speed

After the paper passes the non-sort paper sensor (PI3), the transfer speed is increased, and the space between the preceding paper and following paper is widened (however, the transfer speed varies depending on the type of copying machine to be connected and paper size).

a. Timing in non-sort mode

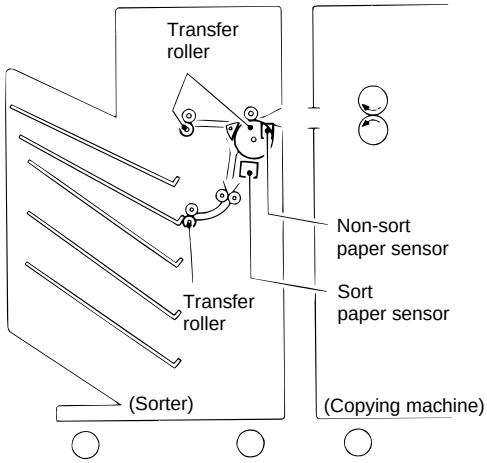


b. Transfer timing in sort/group/staple sort mode



3) Unloading speed

After the paper passes the sort paper pass sensor (PI4), the transfer speed is lowered gradually, and the paper is slowly unloaded into the sort bin.



(4) Transfer guide raising

1) Outline

When double stapling or single stapling is performed, the stapler unit moves toward the rear side.

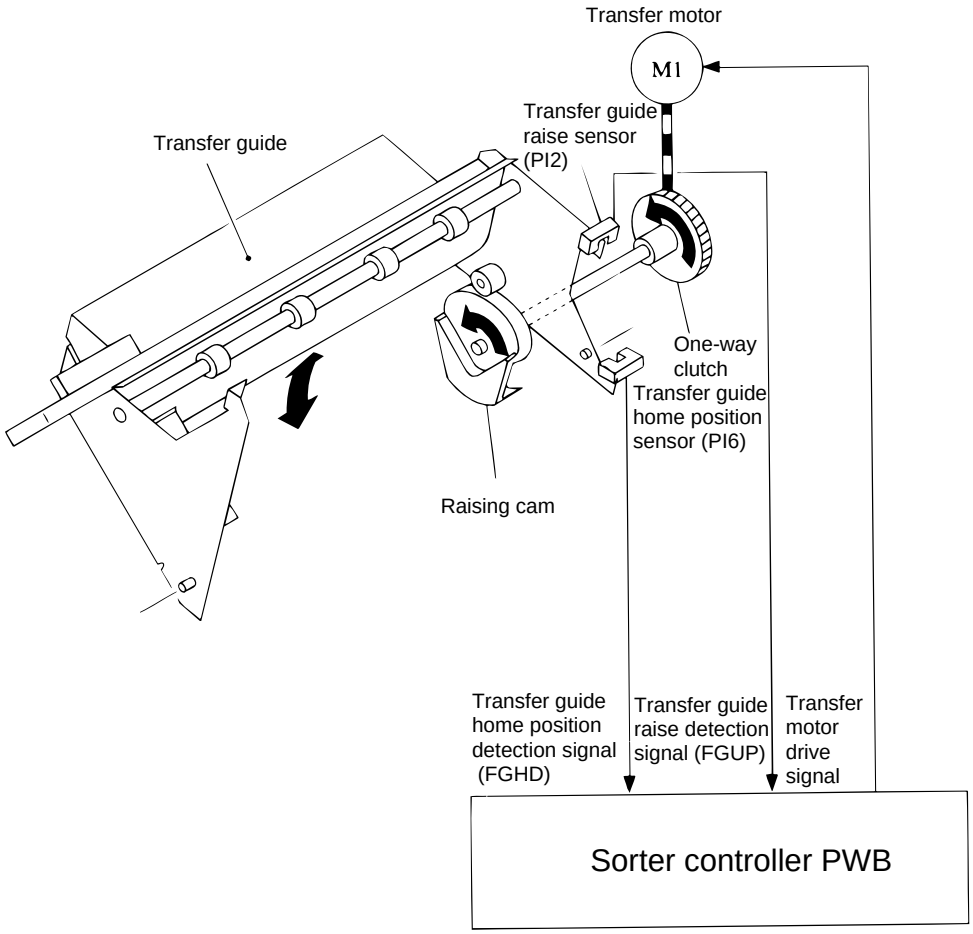
The transfer guide is provided on the forward-rear moving route of stapler unit. When the stapler unit moves toward the rear side, the transfer guide is raised so as to prevent interference of transfer guide with stapler unit.

2) Operation

The transfer motor (M1) is used to raise the transfer guide. Drive of transfer motor (M1) is transmitted to the transfer drive system when it rotates forward. When the motor is reversed, its drive is transmitted to the transfer guide raising drive system.

When the transfer motor (M1) is reversed, its drive is transmitted to the raising cam through the one-way clutch, so that the raising cam is rotated, and thereby the transfer guide is raised.

The transfer guide raise sensor (PI2) and the transfer guide home position sensor (PI6) are provided so as to detect the position of transfer guide.



(5) Transfer motor control

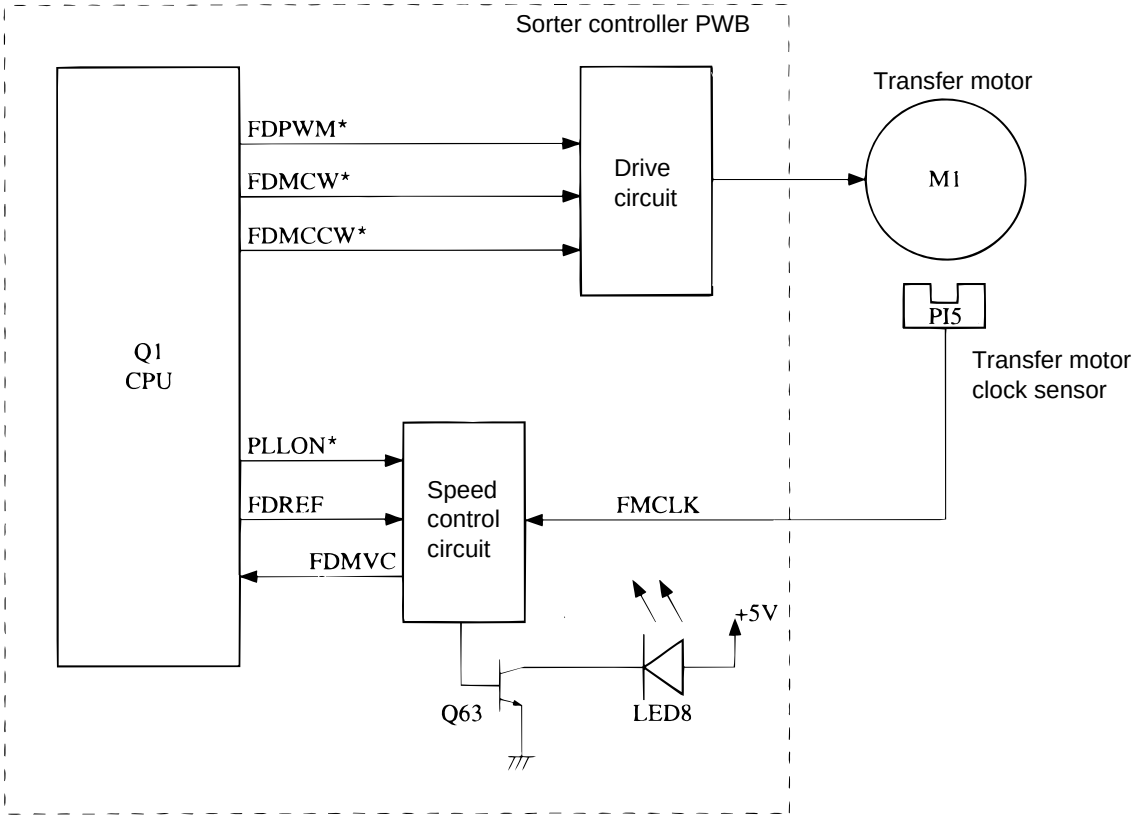
A DC motor is used as a transfer motor.

The microcomputer (Q1) provided on the sorter controller PWB sends the transfer motor control signal (FDPWM*) and rotation direction signal (FDMCW*/FDMCCW*) to the drive circuit and the SPEED CONTROL START signal (PLLON*) and rotational speed reference signal (FDREF) to the speed control circuit.

When the transfer motor (M1) rotates, the transfer motor clock sensor (P15) sends clock signal (FMCLK) to the speed control circuit which compares the clock signal (FMCLK) with the rotational speed reference signal (FDREF) and sends the result, namely transfer motor speed variable signal (FDMVC), to the microcomputer (Q1) provided on the sorter controller PWB.

The microcomputer (Q1) varies the transfer motor control signal (FDPWM*) according to the transfer motor speed variable signal (FDMVC) to keep always the transfer motor rotational speed constant.

LED8 lights while the transfer motor control is normal. If any error occurs in the transfer motor control, LED8 goes out.

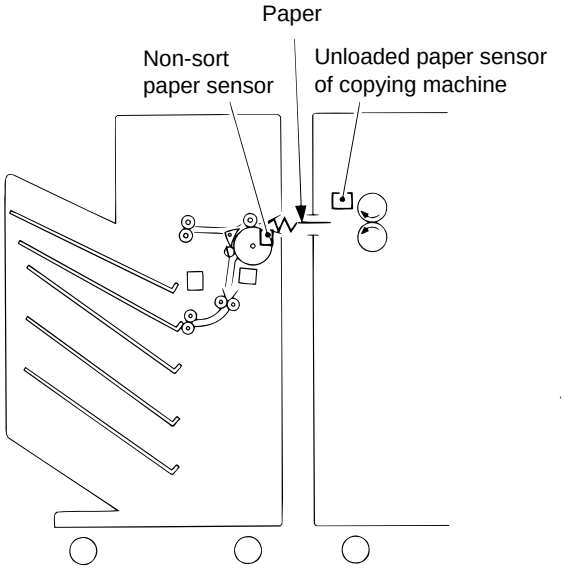


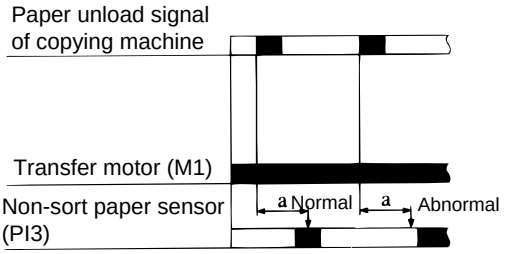
(6) Jam

In the following state the machine sends the jam signal "SJAM" to the copying machine. As a result, the copying machine stops copying operation and lights the PAPER FEED CHECK on the control panel of copying machine.

1) Delay jam

When the non-sort paper sensor (P13) is not turned on after the lapse of specified time (varies depending on the copying machine to be connected) after the machine receives the paper unload signal of copying machine



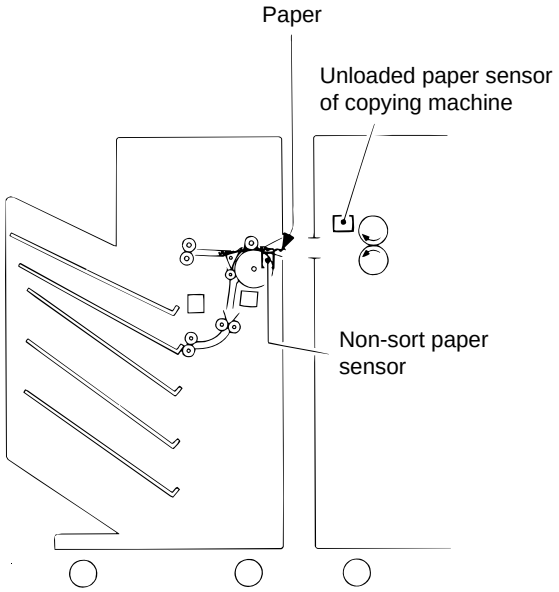


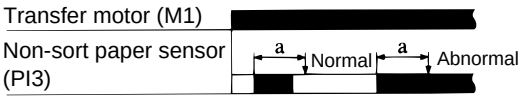
a: Time for 1000 mm transfer

2) Stagnation jam

a. Unloading into non-sort bin

When the non-sort paper sensor is not turned off after the lapse of time for 1000 mm transfer after the non-sort paper sensor is turned on



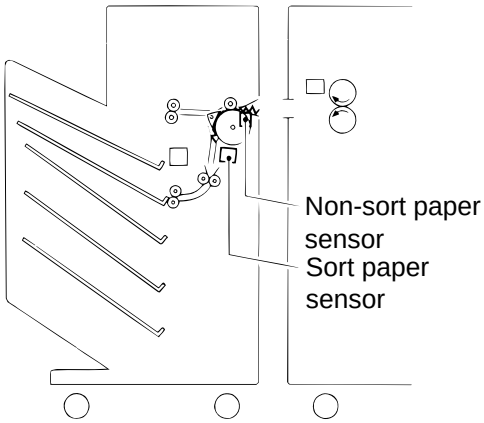


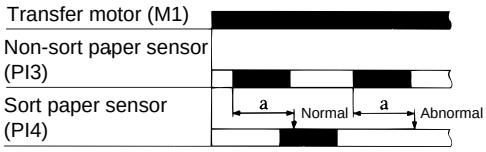
a: Time for 1000 mm transfer

b. In-sorter stagnation jam

1) Nonarrival at sort paper sensor

When the sort paper sensor is not turned on after the lapse of doubled sort paper sensor arrival time after turning-on of non-sort paper sensor is detected

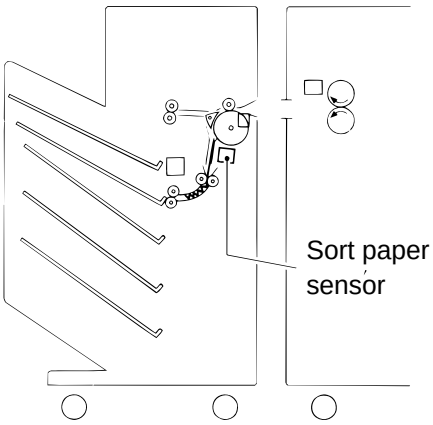


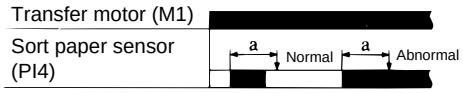


a: Doubled sort paper sensor arrival time

2) Arrival at sort paper sensor

When the sort paper sensor is not turned off after the lapse of 1000 mm transfer time after the sort paper sensor is turned on

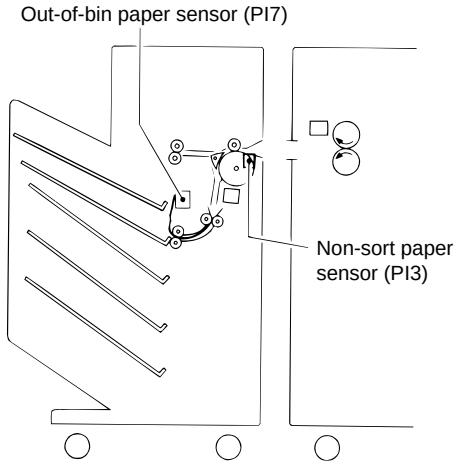


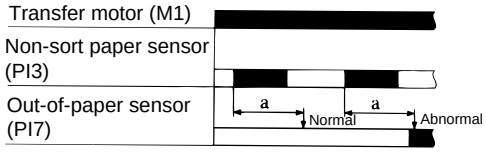


a: Time for 1000 mm transfer

3) Out-of-bin jam

When the out-of-bin paper sensor is turned on within paper transfer completion time after the non-sort paper sensor is turned on





a: Transfer completion time

4) Power-on jam

When any one of paper sensors (PI3, PI4, and PI7) is turned on when power supply is turned on

5) Door open jam

When the front door is opened during operation of machine

* When the COPY START key is pressed again after disposal of jam, the remaining copies are made automatically by the jam correcting function (excepting out-of bin jam).

If jam occurs in the copying machine, all the papers being carried in the sorter are unloaded into the specific bin, and then the sorter is stopped.

B. Bin unit drive system

(1) Outline

The bin unit drive system consists of the following drive systems.

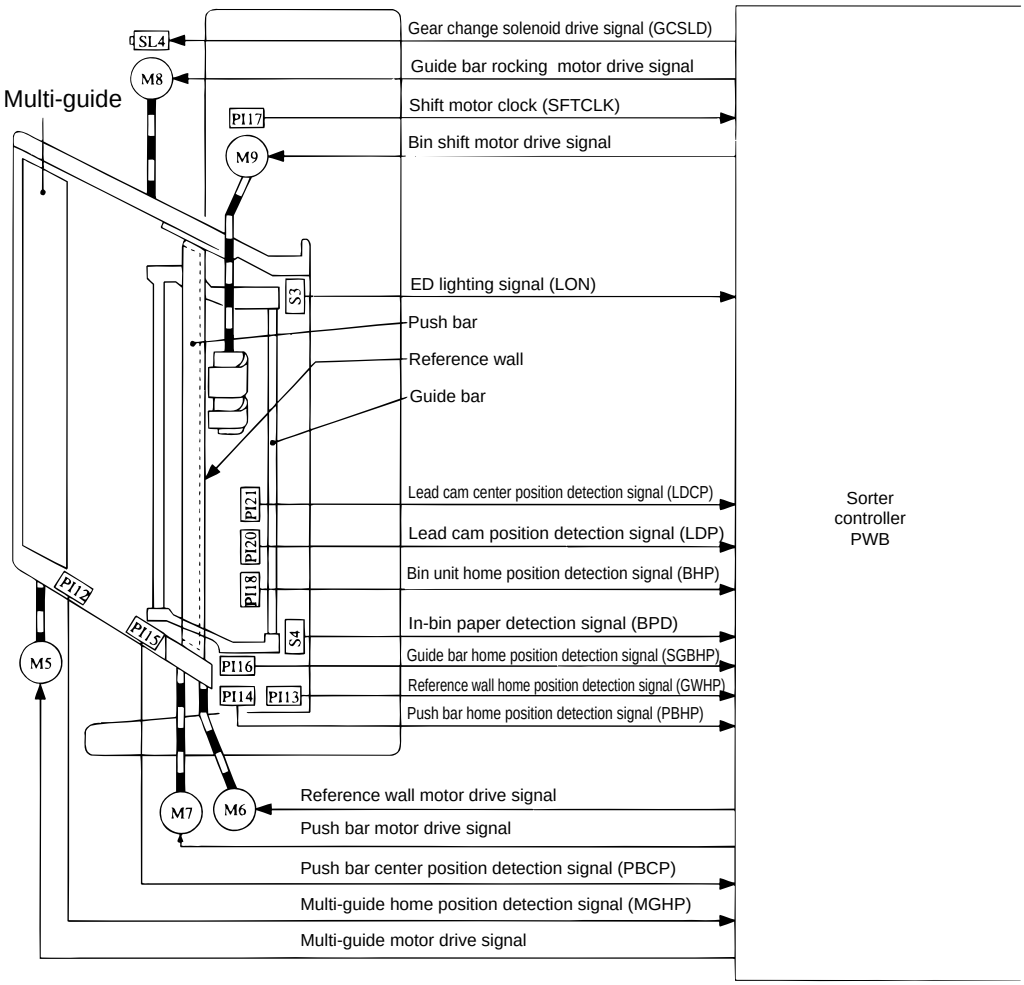
* Bin drive system
* Guide bar drive system
* Push bar drive system
* Restricting plate drive system

The bin is driven by the bin shift motor (M9) and is moved up and down.

The guide bar is driven by the guide bar motor (M8) and aligns the unloaded copies (papers) and pushes out them toward the front side.

The push bar is driven by the push bar motor (M7) and pushes out the unloaded papers toward the front side.

The restricting plate drive system consists of the reference wall drive system and the multi-guide drive system. The reference wall is driven by the reference wall motor (M6), and the multi-guide is driven by the multi-guide motor (M5).

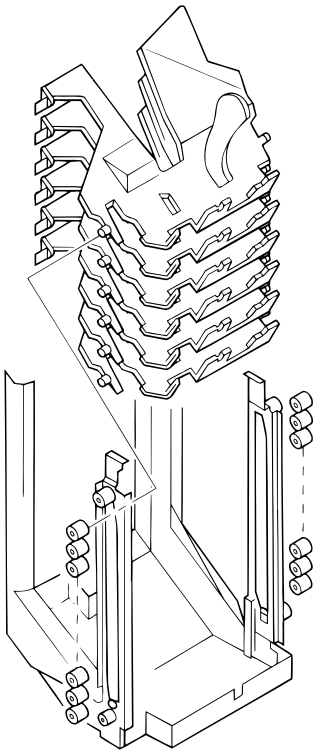


(2) Bin unit

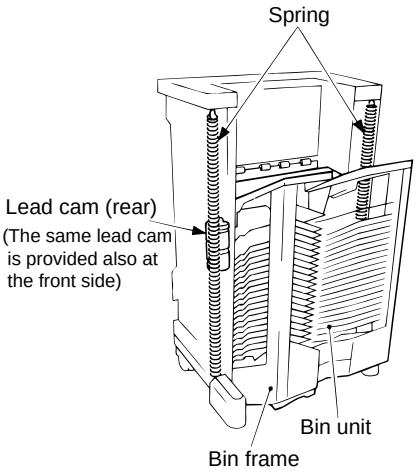
1) Composition of bin unit

The bin unit has the composition shown below.

Rollers are provided at both sides of each bin, at the outer sides of bin frame.



The bin unit is hung from the sorter with two springs as shown below and fixed with lead cams engaged with the rollers fitted to the front and rear side of bin frame.



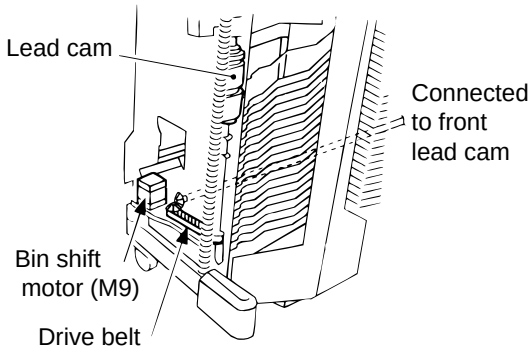
For reference

Function of springs provided at the front and rear sides of bin unit

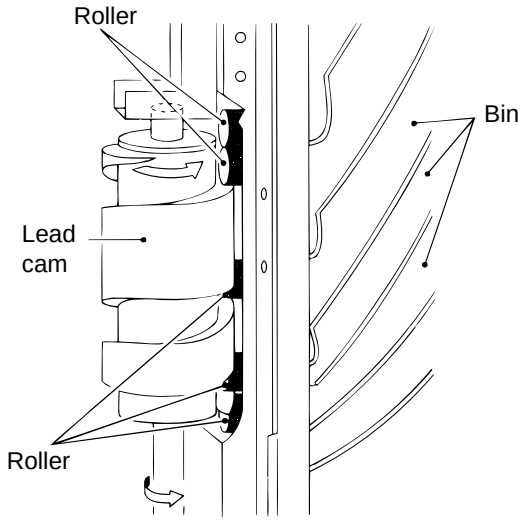
Weight of bin unit is about 17 kg. Two springs are used to hand the bin unit, reducing the load applied to the lead cams.

2) Function of lead cam

The lead cam engages with the roller of bin unit. The lead cam is driven by the bin shift motor (M9) which is reversible.When the lead cam is rotated and the roller

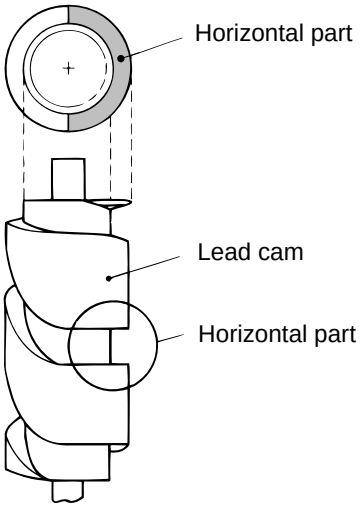


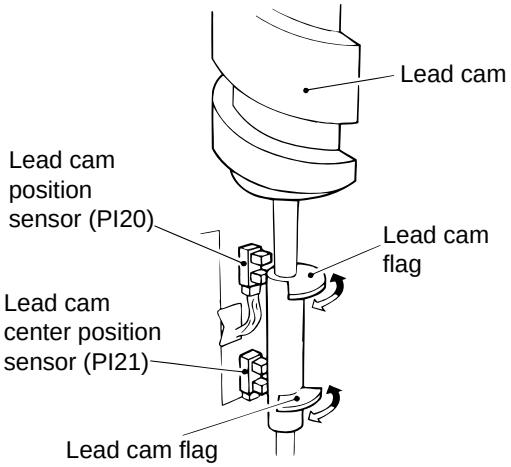
moves up and down along the slope of lead cam, the bin connected to the bin frame and rollers is moved up and down.



However, if the lead cam groove is tilted in the whole range, the lead cam rotates under the influence of weight of bin unit when the bin stops. So as to prevent this rotation, the lead cam groove has the horizontal part as shown in the figure below. When the bin unit stops, the lead cam position sensor (PI20) detects the position so that the roller is located on the horizontal part.

The lead cam center position sensor (PI21) is provided to detect the center position of horizontal part of lead cam. It is used to synchronize with the stapling operation and to ensure smooth stapling.


Horizontal part
Lead cam
Horizontal part

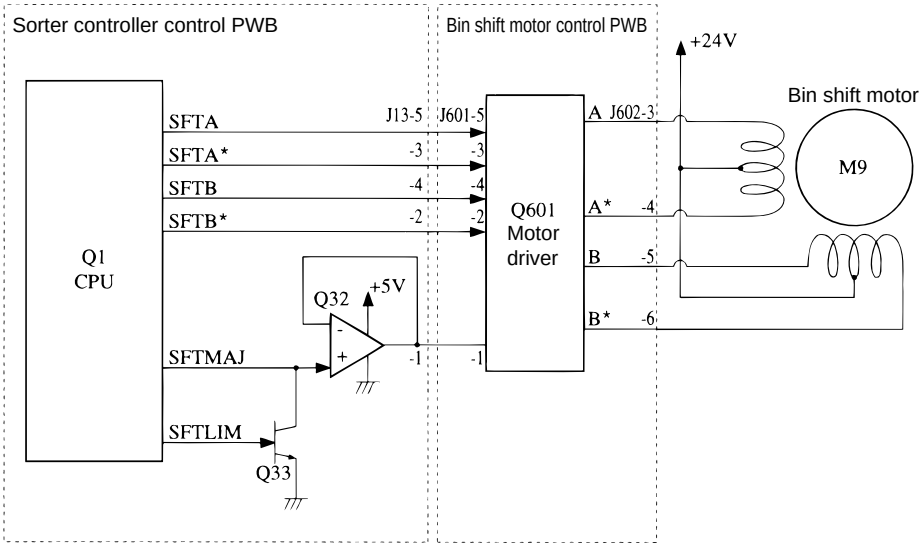

Lead cam
Lead cam position sensor (PI20)
Lead cam flag
Lead cam center position sensor (PI21)
Lead cam flag

3) Bin shift motor control

The bin shift motor (M9) is a 4-phase control stepping motor. ON/OFF and rotation direction of bin shift motor (M9) are changed by controlling the output timing of pulse signals A, A*, B, B*.

When the bin shift motor (M9) is in HOLD state, the output timing of pulse signals A,A*, B, B* is fixed, and the level of reference current signal (SFTAJ) is changed for HOLD.

When the bin shift operation prohibition signal (SFTLIM) is output, the bin shift motor (M9) cannot be driven. The bin shift prohibition signal (SFTLIM) is output when the paper holder sensor (PI11) is off.



4) Bin shift motor rotation control

Continuous or intermittent rotation of the bin shift motor which is used to drive the lead cams is controlled based on the copy speed data which is sent from the copying machine.

Continuous rotation: Copy speed 20 CPM or more

Intermittent rotation: Copy speed less than 20 CPM

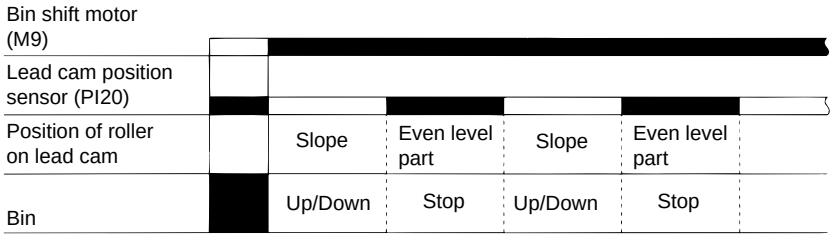
In case of continuous rotation the microcomputer provided on the sorter controller PWB controls the rotational speed of bin shift motor so that one shift can be performed during interval of copy paper.

In case of intermittent rotation the microcomputer provided on the sorter controller PWB controls the bin shift motor as follows.

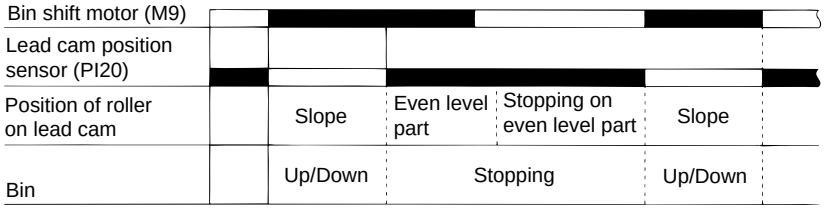
Paper unloading : Shifts the bin rollers to the boundary between the parallel part and the slope and stops.

Transfer : One bin shift

a. Continuous rotation (copy speed 20 CPM or more)



b. Intermittent rotation (copy speed less than 20 CPM)



(3) Guide bar control

1) Outline

The guide bar is provided in the bin unit. It performs the rocking motion as shown in the figure below.

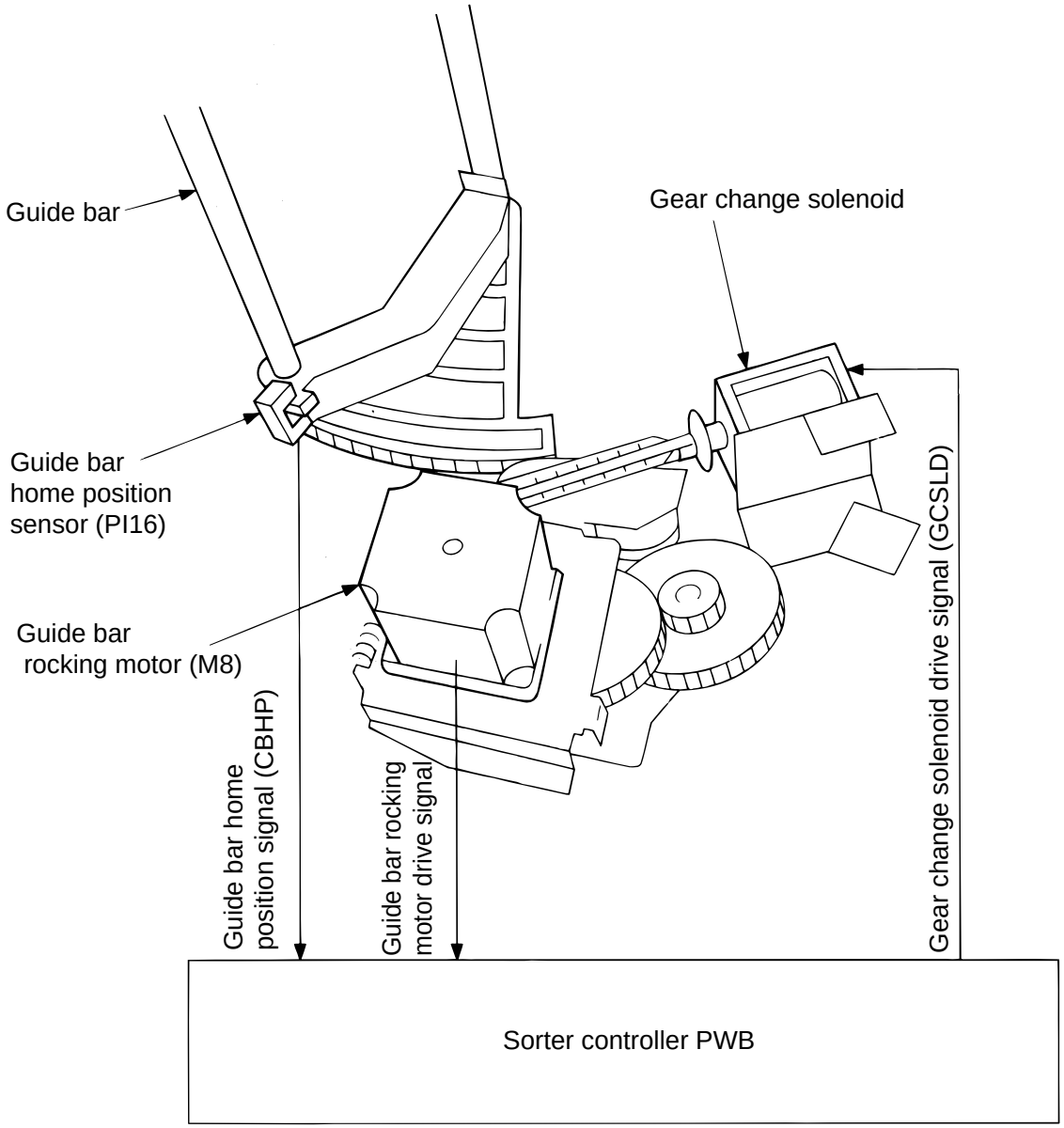
The guide bar has the following functions.

1. Paper alignment
2. Paper push-out

The guide bar is driven by the guide bar rocking motor (M8).

The guide bar home position sensor (PI16) detects that the guide bar exists in its home position.

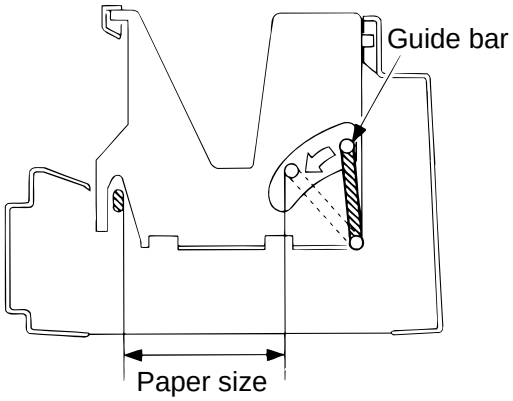
The gear change solenoid (SL4) is turned on when papers are pushed out and used to change the combination of gears of drive system.

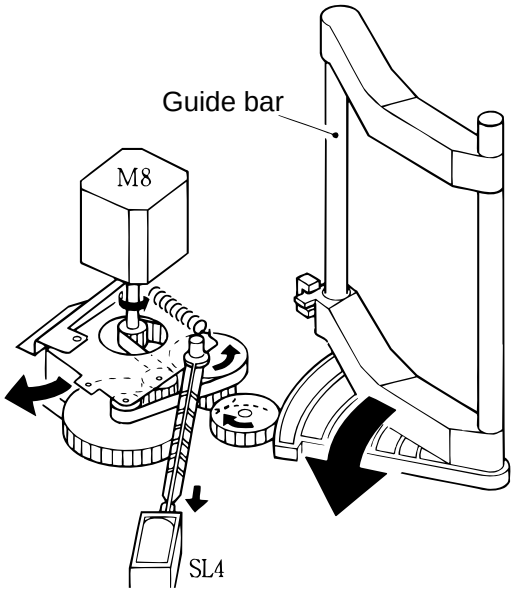


2) Alignment

The guide bar performs aligning operation whenever paper is unloaded. It presses papers when papers are stapled.

The guide bar rocking width is set by the paper size signal given from the copying machine. (Paper size: 210 to 297 mm)



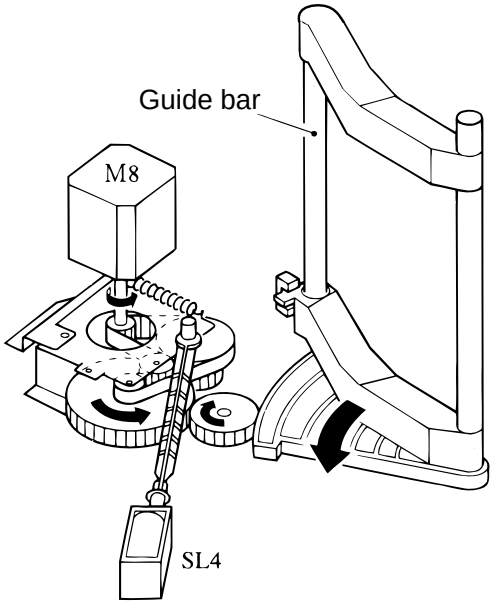


3) Push-out operation

In addition to aligning operation the guide bar performs the paper push-out operation in the FRONT ACCESS mode.

The paper push-out causes greater load upon the drive motor than in aligning operation. The machine is designed so that the combination of gears of guide bar drive system is changed so as to increase the guide bar rocking power.

The drive system gear combination is changed by the gear change solenoid (SL4).



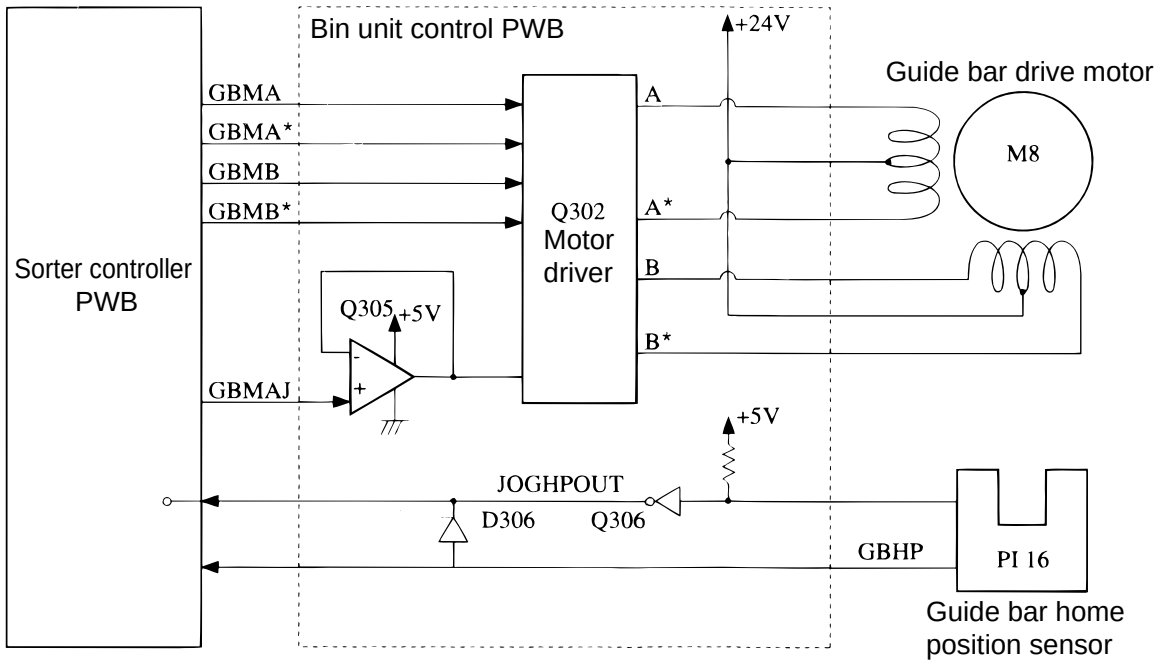
4) Guide bar rocking motor (M8) control

The guide bar rocking motor is a 4-phase control stepping motor.

The sorter controller PWB sends the drive pulses (GBMA, GBMA*, GBMB, GBMB*) and reference current signal (GBMAJ) to the motor driver.

The motor driver changes ON/OFF and rotation direction of guide bar rocking motor (M8) by controlling the output timing of pulse signals A,A*, B,B* according to specific signals.

When the guide bar rocking motor (M8) is in HOLD state, the output timing of pulse signals A,A*, B, B* is fixed, and the level of reference current signal (GBMAJ) is chanted for HOLD.



(4) Push bar control

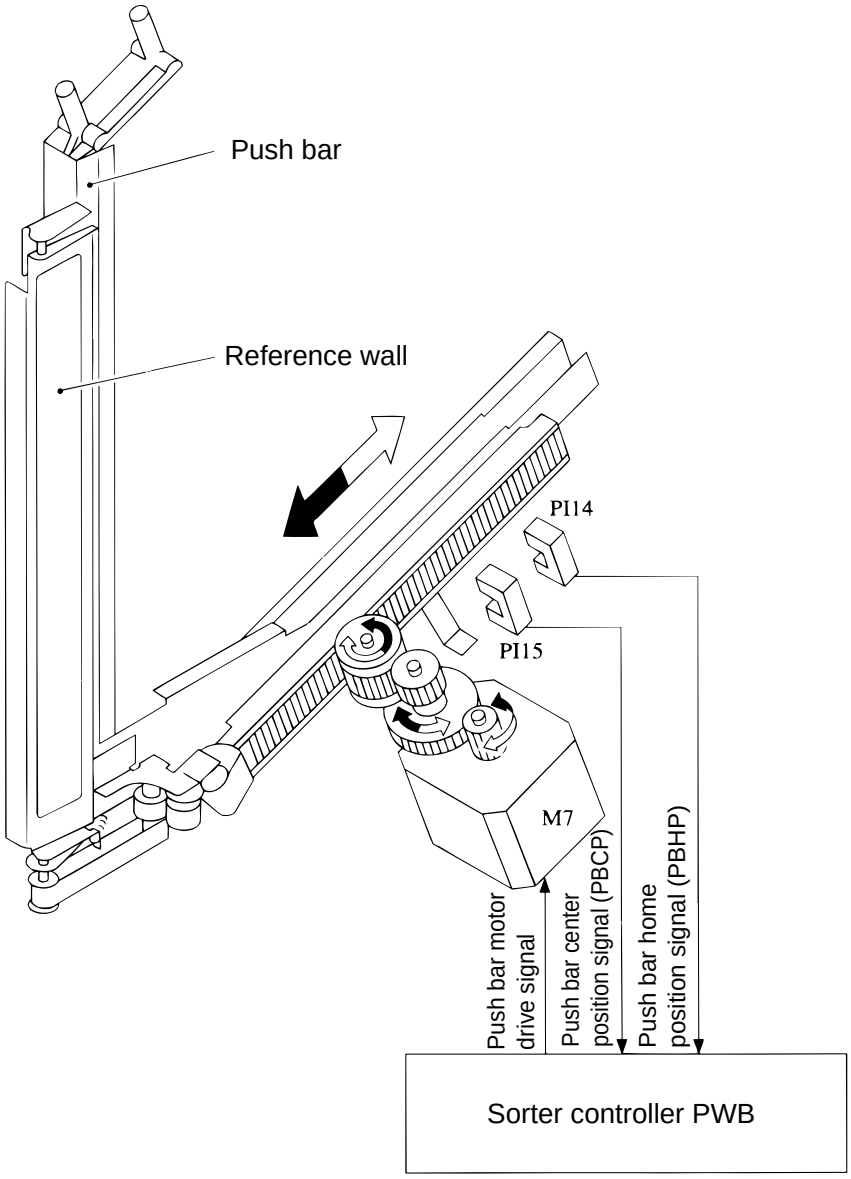
1) Outline

The push bar is provided in the bin unit of the machine. The push bar is actuated only when front access is performed. In other states the push bar is standing still in the specified position. The push bar, being synchronized with the guide bar in the FRONT ACCESS mode, pushes out papers toward the front side.

The push bar is driven by the push bar motor (M7). Two sensors are provided so as to check the position of push bar.

Push bar home position sensor (PI14)

Push bar center position sensor (PI15)



2) Operation

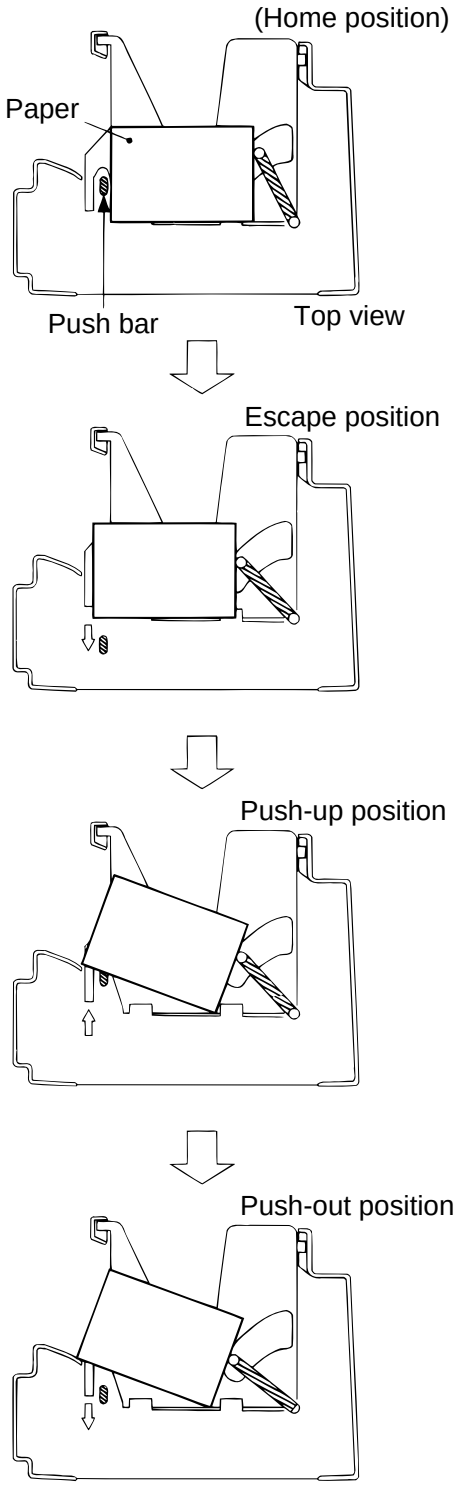
a. Outline

The push bar is driven by the push bar motor (M7). It moves in the bin unit in parallel with the paper unloading direction.

The push bar has two stop potions for copying operation and 4 stop positions for front access operation. Each stop position is controlled by pulse control of push bar motor (M7) from the home position.

Stop position (for reference)

Stop position	Distance from home position
Home position	0mm
Push-up position	26.4mm
Push-out position	36.4mm
Escape position	148.9mm



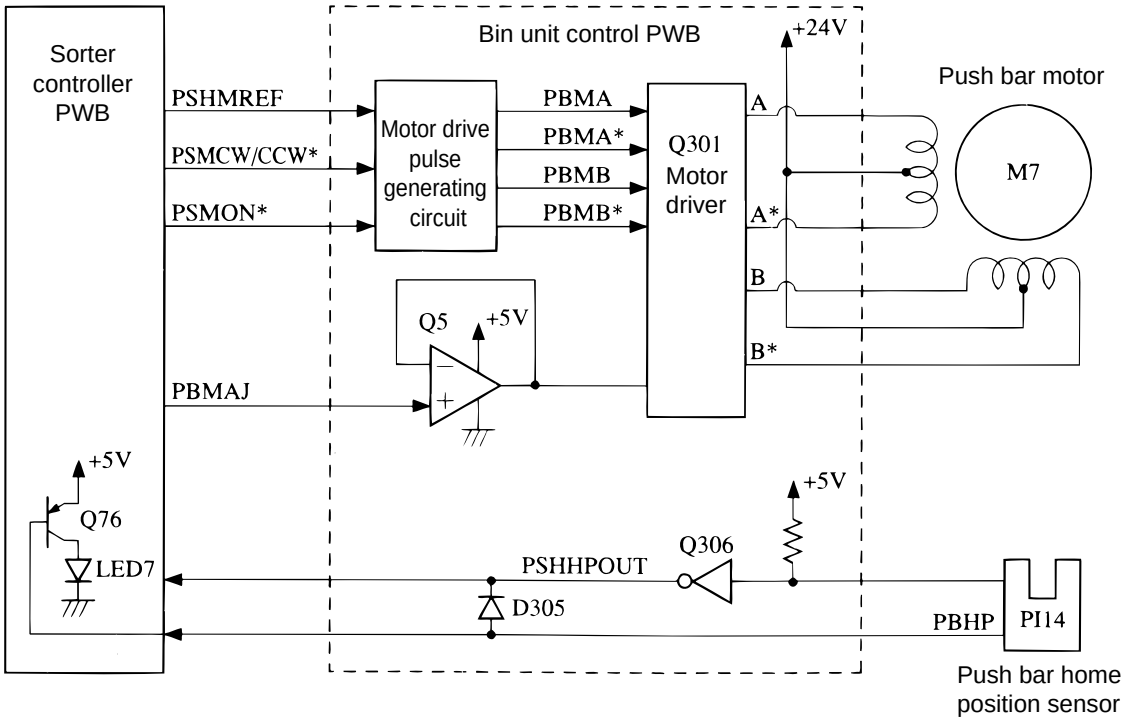
b. Operation of push bar in front access mode

3) Push bar motor (M7) control

The push bar motor is a 4-phase control stepping motor.

The sorter controller PWB sends the drive pulses (PBMA, PBMA*, PBMB, PBMB*) and the reference current signal (PBMAJ) to the motor driver. The motor driver changes ON/OFF and rotation direction of push bar motor (m7) by controlling the output timing of pulse signals (A, A*, B, B*) according to signals.

When the push bar motor (M7) is in HOLD state, the output timing of pulse signals A, A*, B, B* is fixed, and the level of reference current signal (PBMAJ) is changed for HOLD.



(5) Restricting plate control

1) Outline

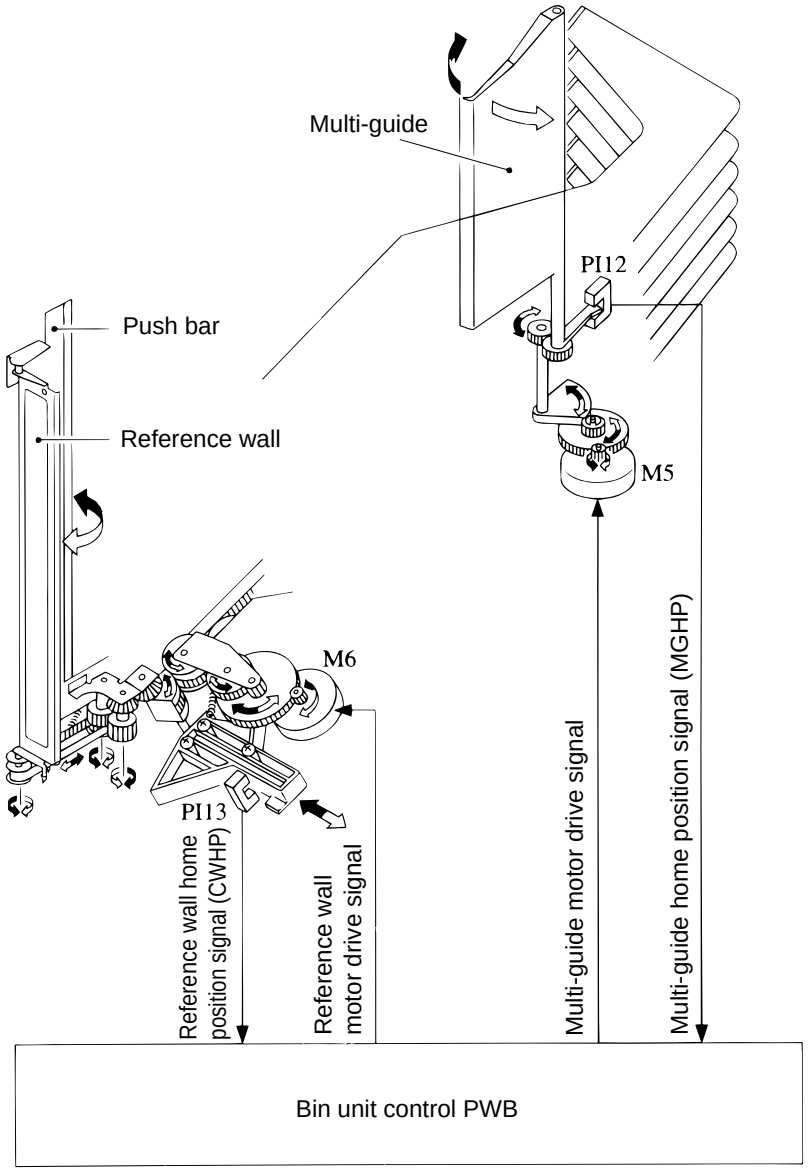
The position of restricting plate is changed according to paper size and copy mode.

The restricting plate consists of reference wall and multi-guide.

The reference wall is provided in the push bar and driven by the reference wall drvie motor (M6).

The reference wall home position sensor (PI13) is provided to detect the position of reference wall.

The multi-guide is driven by the multi-guide motor (M5). The multi-guide home position sensor (PI12) is provided to detect the position of multi-guide.

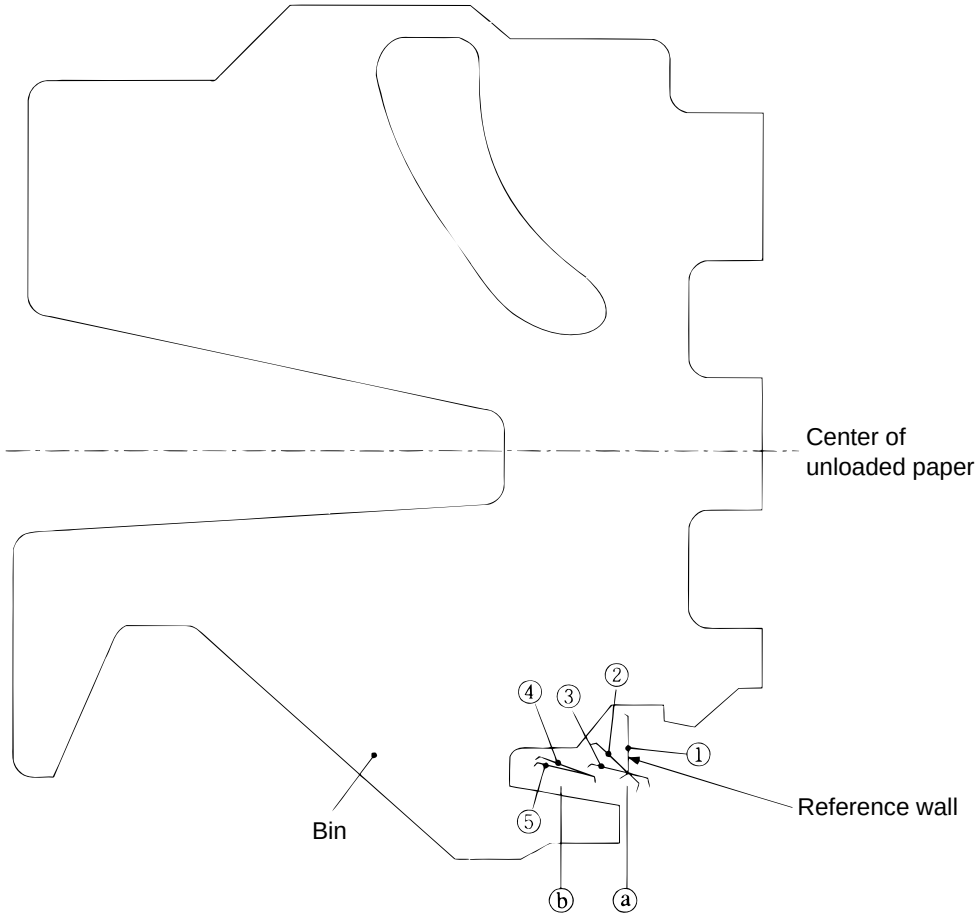


2) Operation of reference wall

The reference wall is provided in the push bar. The opening angle of reference wall is changed according to paper size and modes to change the front side stop position of paper. The reference wall is operative only when the push bar is in the following position.

Center position (while the push bar center position sensor (PI15) is on)

The opening angle of reference wall is set based on the paper size data which is sent from the copying machine. The rear and front stapling positions in case of double stapling are approximately symmetric owing to change of opening angle of reference wall.



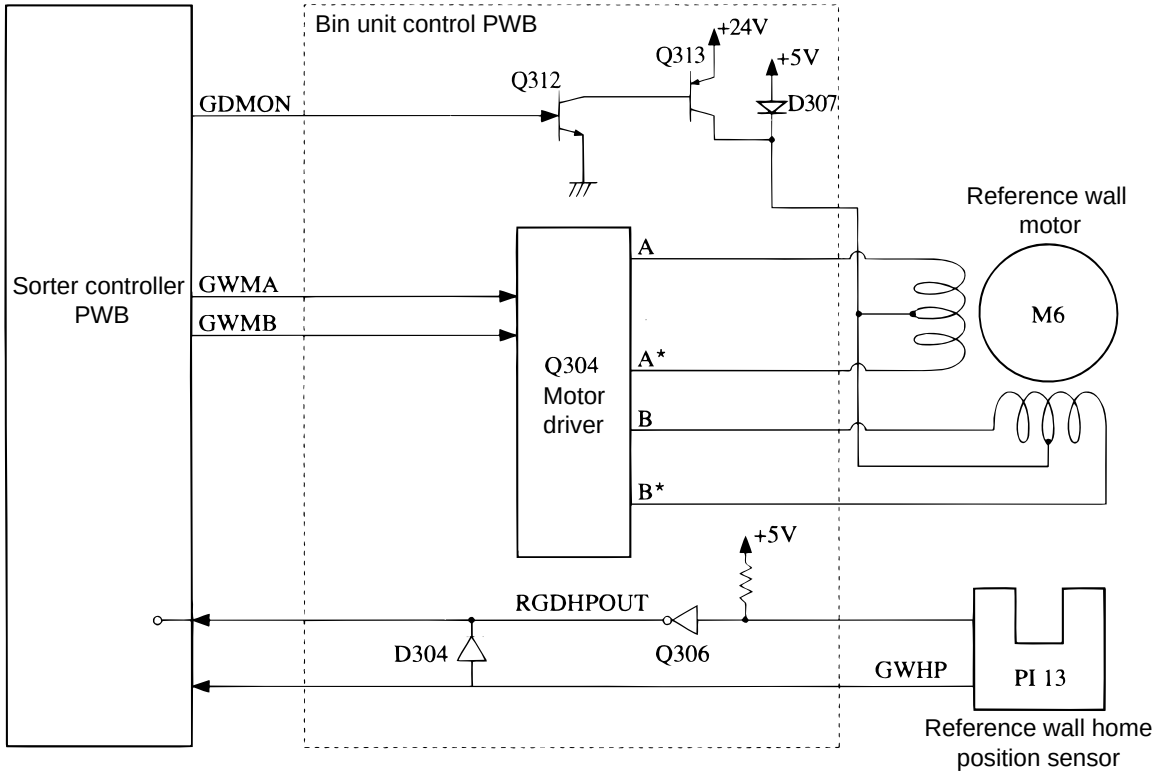
(Reference data)

Copy mode	Paper size	Position of restricting plate	Push bar position	Distance from center of unloaded paper (mm)
Single or double stapling	B5,B4	①	ⓐ	136
	8 1/2×11R,11×17,A4R	②		146.5
	A4,A3	③		156
	8 1/2×11R,8 1/2×14	④	ⓑ	153
Corner stapling	A4,B5,A3,B4,A4R,8 1/2×11R, 11×17	⑤		156
Modes other than STAPLE SORT mode	B5,B4	①	ⓐ	136
	8 1/2×11R,11×17,A4R	②		146.5
	A4,A3	③		156
	8 1/2×11R,8 1/2×14	④	ⓑ	153
	Others	③	ⓐ	156

3) Reference wall motor (M6) control

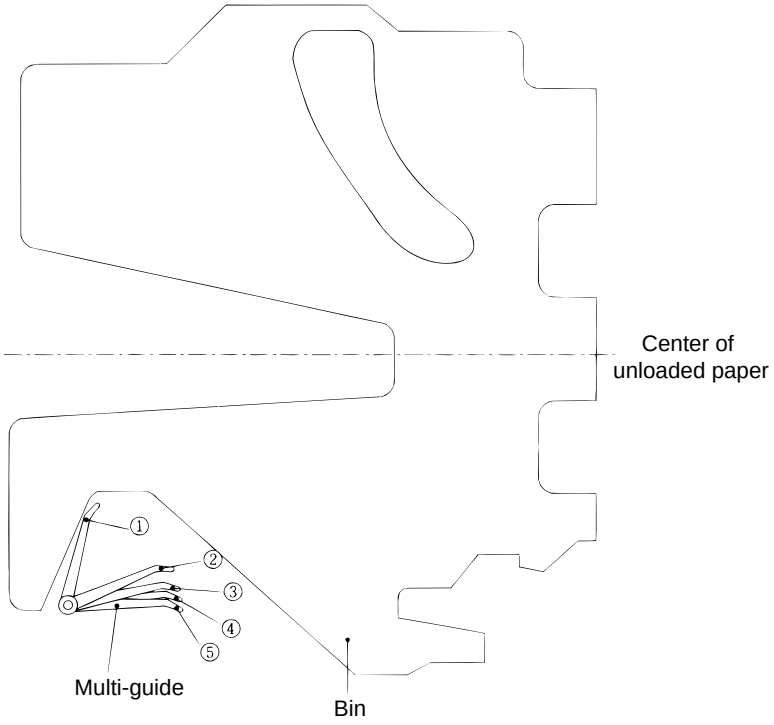
The reference wall motor is a 4-phase stepping motor. The sorter controller PWB sends the referemce wall motor ON signal (GWMON) and control signals (GWMA, GWMB) to the bin unit control PWB. The motor driver (Q304) changes the rotation direction of reference wall motor (M6) by controlling the output timing of pulse signals (A, A*, B, B*) according to the control signals (GWMA, GWMB).

While the reference wall motor ON signal (GWMON) is not generated (while the motor is at reset), voltage +5V is applied to each phase of reference wall motor to fix rotation of reference wall motor.



4) Operation of multi-guide

The opening angle of multi-guide is changed according to paper size and modes to change the front access stop position of paper. The opening angle of multi-guide is set based on the paper size data and mode sent from the copying machine.



(Top view)

(Reference data)

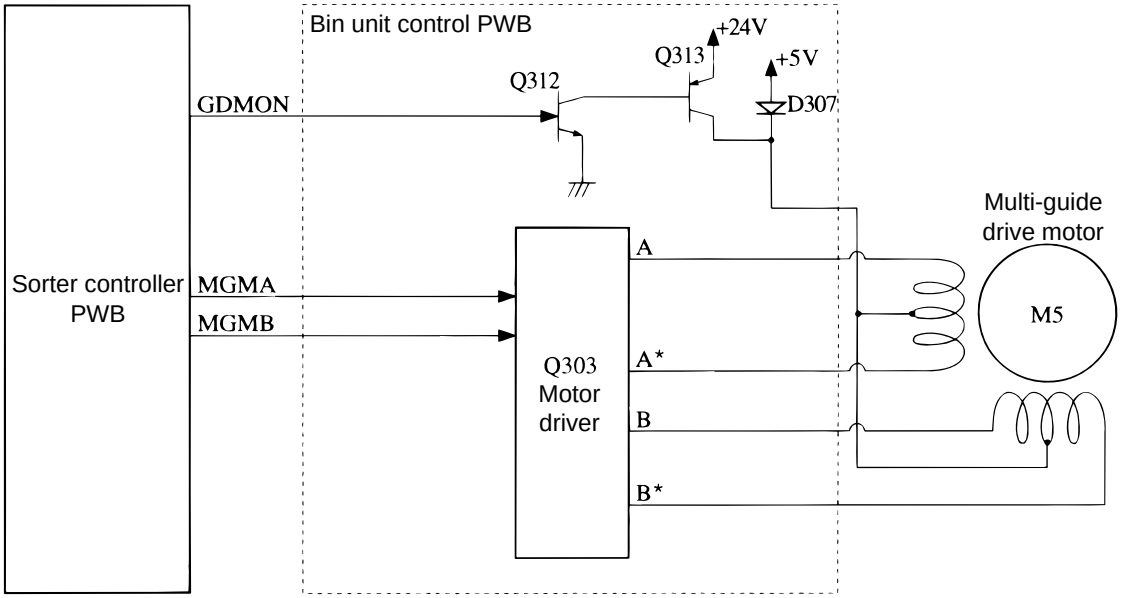
Copy mode	Paper size	Position	Distance from center of unloaded paper (mm)
Signle or double stapling	A4,B5,8 1/2×11R	①	95
	B4	②	136
	11×17,A4R	③	146.5
	8 1/2×11R,8 1/2×14	④	153
	A3	⑤	156
Corner stapling	A4,B5,8 1/2×11	①	95
	A3,B4,A4-R,11×17,8 1/2×14	⑤	156
Modes other than STAPLE SORT mode	All sizes	⑤	156

5) Multi-guide motor (M5) control

Below is shown the control circuit of multi-guide motor (M5). The multi-guide motor is a 4-phase stepping motor.

The sorter controller PWB sends the multi-guide motor ON signal (GDMON) and control signals (MGMA, MGMB) to the bin unit control PWB. The motor driver (Q303) changes the direction of rotation of reference wall motor (M5) by controlling the output timing of pulse signals (A, A*, B, B*) according to the control signals (MGMA, MGMB).

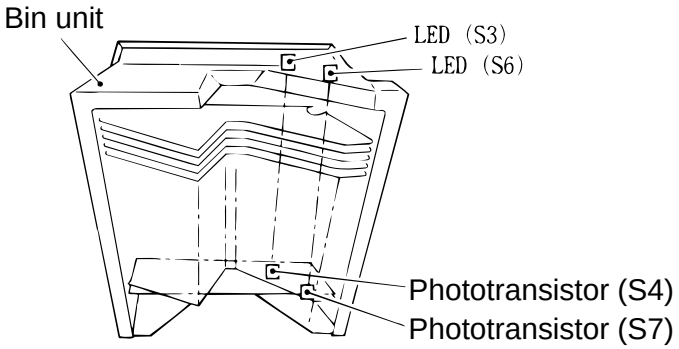
While the multi-guide motor ON signal (GDMON) is not generated (while the motor is at reset), voltage +5V is applied to each phase of reference wall motor to fix the rotation of multi-guide motor.

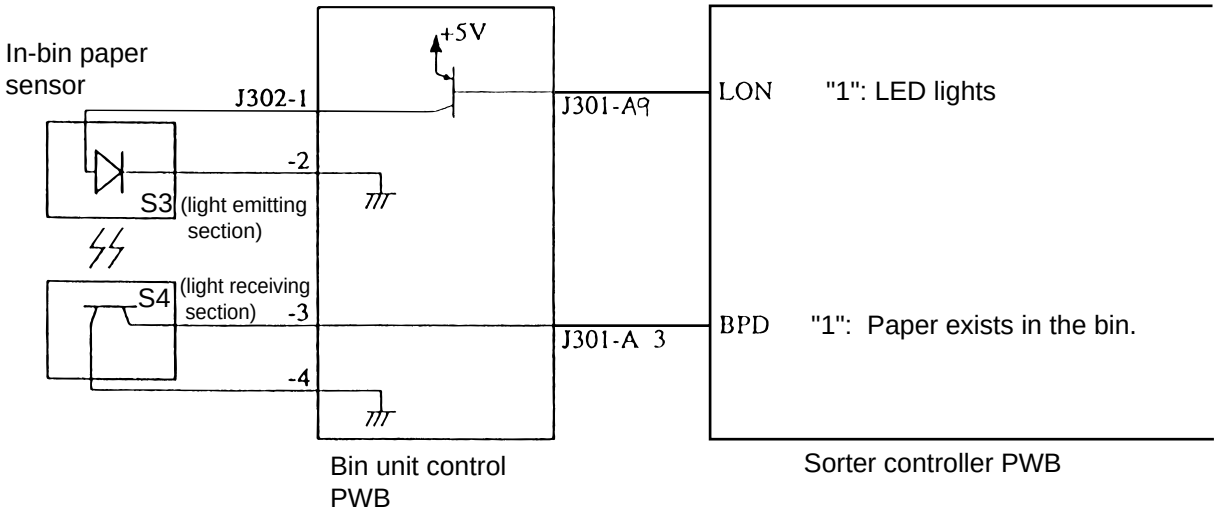


(6) In-bin paper sensor

1) Outline

The in-bin paper sensor consists of LED and phototransistor. It detects paper in the bin.

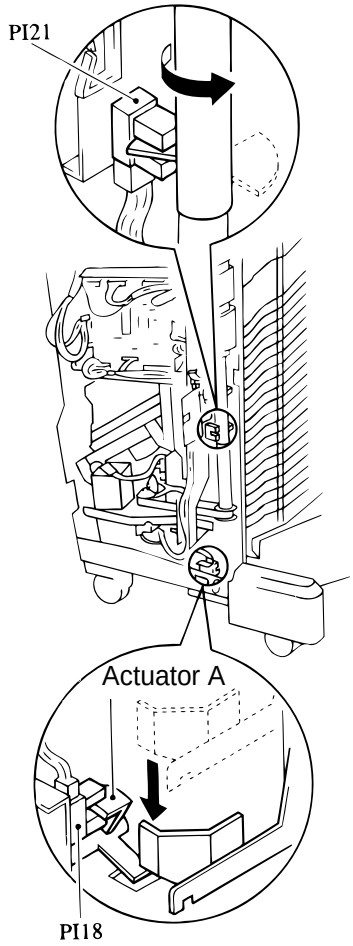




(7) Other sensors

1) Bin unit home position sensor (PI18)

When the COPY START key is set to ON or when all the papers unloaded into the bin are removed, the bin unit is returned to its home position. In this case the acutator A shuts off the bin unit home position sensor (PI18), and sends an information (arrival of bin unit at its home position) to the microcomputer provided on the sorter controller PWB.



2) Detection of lower limit

The lower limit of bin unit is detected with the bin unit home position sensor (PI18) and lead cam center position sensor (PI21).

If any abnormality occurs and the lead cam is about to rotate in the bin unit lowering direction, running over the lead cam center position sensor, the microcomputer provided on the sorter controller PWB stops at once the drive of bin shift motor (M9).

■ **Resetting**

Turn off the power supply for the copying machine, and then turn it on again.

C. Stapler unit drive system

(1) Outline

The stapler unit staples the papers unloaded into the bin. There are three types of stapling, namely corner stapling, double stapling and single stapling.

The stapler unit performs the following 4 operations.

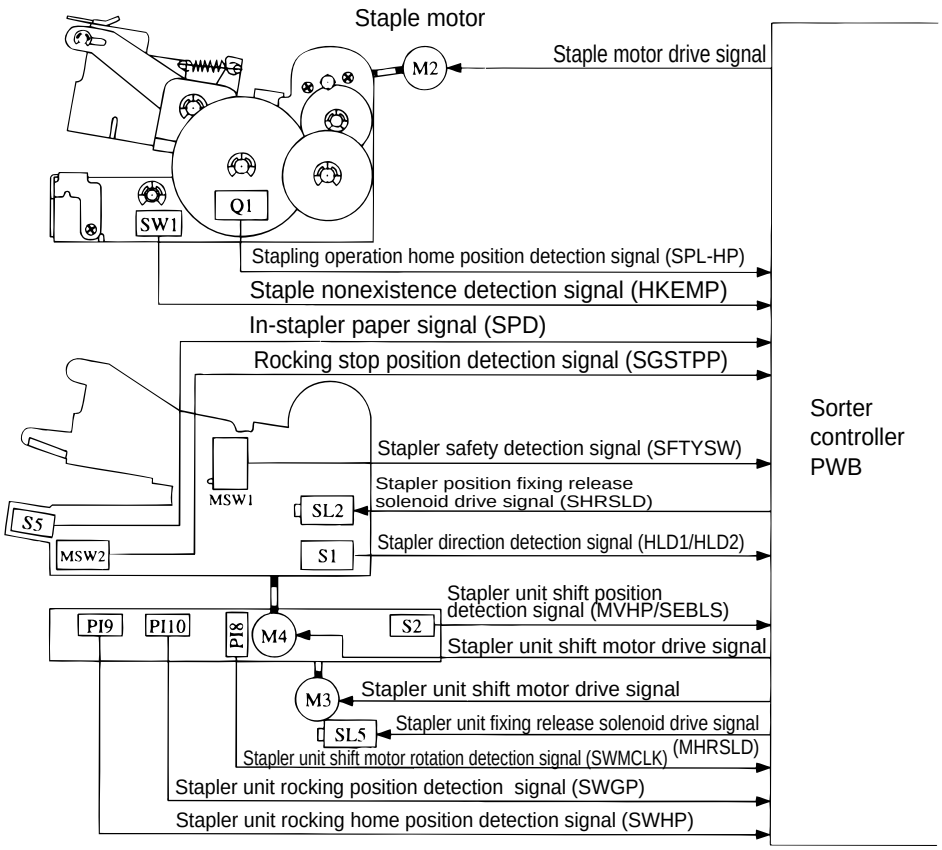
* Stapling operation
* Stapler unit direction change
* Stapler unit shift
* Stapler unit rocking

The staple motor (M2) is used to drive the staple unit.

As stapler unit direction change is performed concurrently with shift of stapler unit, specific drive system is not provided individually.

The stapler unit shift motor (M3) is not used to shift the stapler unit. The stapler unit position sensor (S2) detects the position of stapler unit.

The stapler unit rocking motor is used to rock the stapler unit. The stapler unit rocking position sensor (PI10) and the stapler unit rocking home position sensor (PI9) detect the rocking position.



(2) Stapler unit

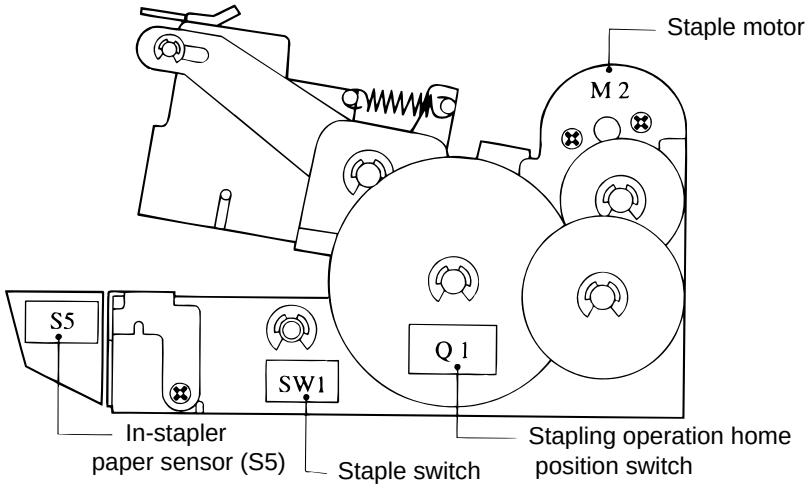
1) Outline

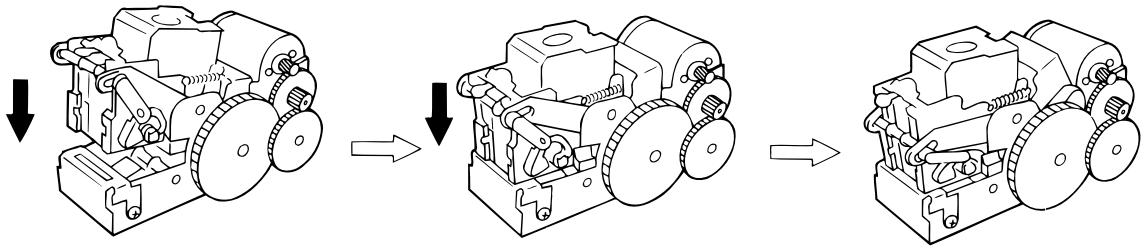
The stapler unit has the composition shown in the figure below.

The staple motor (M2) is used for stapling drive. The stapling operation is performed by rotating cam. The stapling home position sensor (Q1) detects that one stapling operation was done.

The staple sensor (SW1) detects existence/ nonexistence of staple in the staple cartridge.

The in-stapler paper detection sensor (S5) detects that paper has been inserted into the stapler unit so as to prevent troubles due to no-load stapling (stapling without papers).





2) Staple motor (M2) control

a. Outline

Below is shown the control circuit for the staple motor. The staple motor (M2) is a DC motor. This circuit has mainly the following functions.

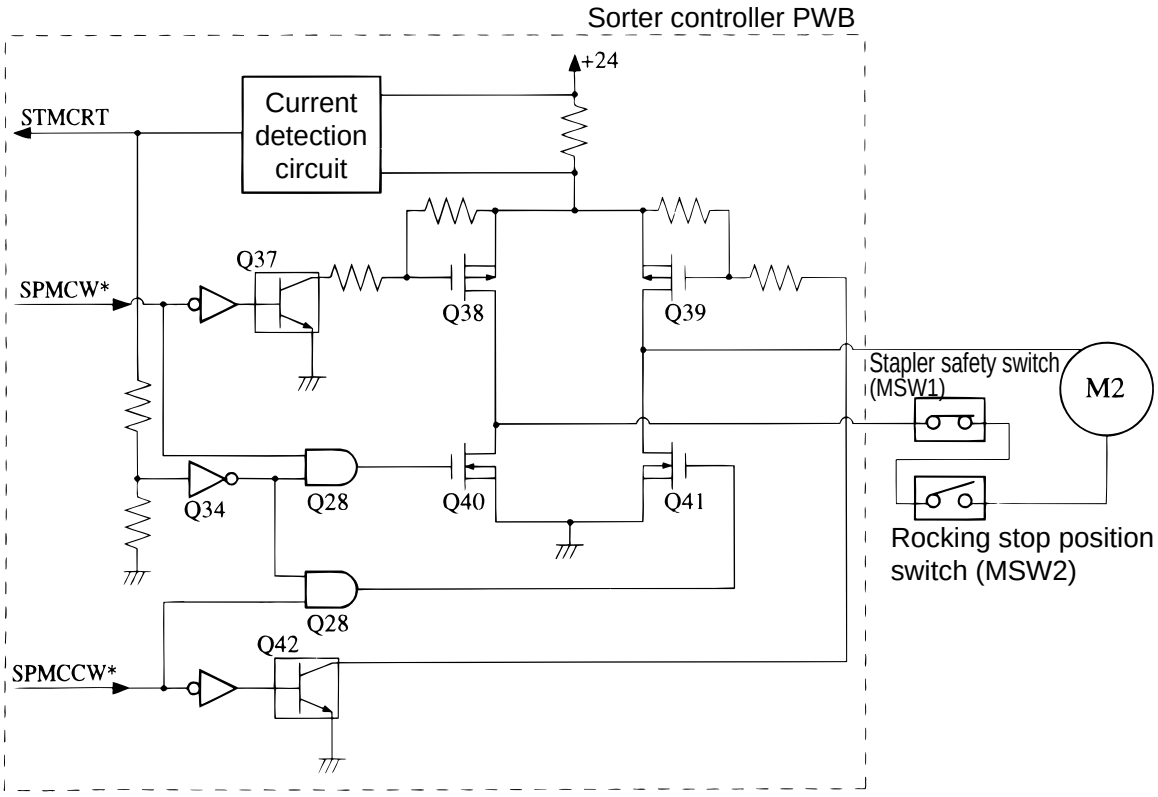
- Staple motor ON/OFF control
- Rotation direction control of staple motor
- Overcurrent protection of staple motor

Two microswitches are provided on the power supply route to the staple motor (M2).

- Stapler safety switch (MSW1)
- Rocking stop position sensor (MSW2)

When any substance having a size of about 6 mm or more entered into the stapler unit, power supply for staple motor (M2) drive is turned off.

The rocking stop position sensor supplies power for the staple motor (M2) drive only when the stapler unit is in normal stapling position.



b. Staple motor ON/OFF control

The staple motor ON/OFF and rotation direction control is actuated by combination of the following two control signals.

1) Staple motor forward rotation signal (SPMCW*)

2) Staple motor reverse signal (SPMCCW*)

Rotation direction of staple motor	SPMCW*	SPMCCW*
Forward	0	1
Reverse	1	0
Stop	1	1

c. Overcurrent protection of staple motor

When the staple motor starts rotating, the current detection circuit detects always current supplied to the staple motor.

The detected data is sent to the microcomputer (Q1) provided on the sorter controller PWB as a staple motor status signal (STMCRT). When the specific level is exceeded, the staple motor status signal (STMCRT) is set to "1" and sent to the gate circuit (Q28) through the inverter (Q34). When the gate circuit (Q28) receives the staple motor status signal (SPMCW*), it sets the staple motor forward rotation signal (SPMCW*) and staple motor reverse signal (SPMCCW*) to "0". As a result, the staple motor stops.

3) Staple motor control in case of staple jam

When staple jam occurs in the stapler unit, the staple motor (M2) is controlled as follows.

1) Overload is applied to the staple motor due to staple jam.

⇩

2) The stapler cannot return to its home position within one second after the stapler starts stapling operation.

⇩

3) The staple motor is reversed, and return to stapling home position is performed.

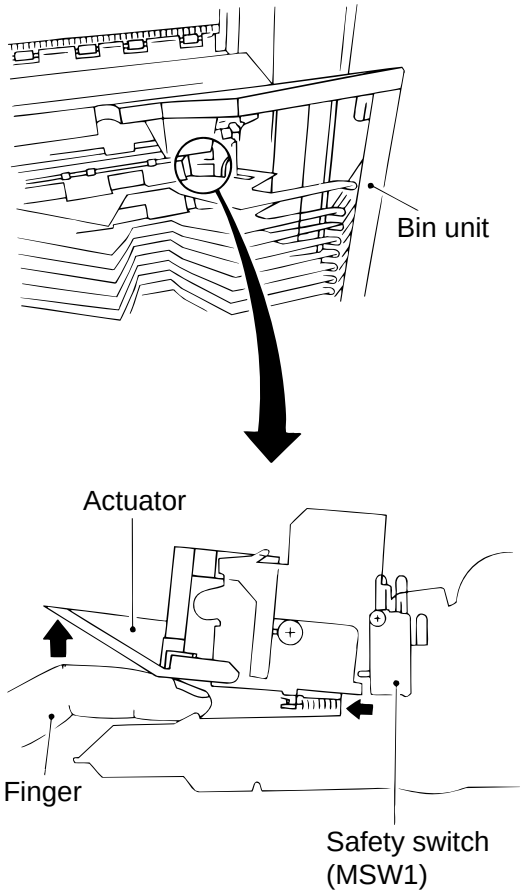
⇩

4) An alarm is output to the copying machine.

4) Safety switch (MSW1)

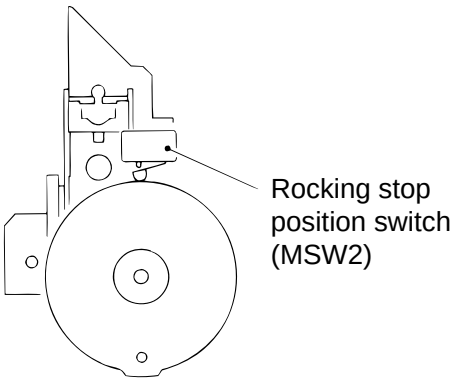
If worker's finger was inserted into the stapling area in the bin, the actuator is raised, and the safety switch 2 is turned off.

When the safety switch 2 is turned off, the drive power supply (24V) for the staple motor (M2) is turned off, so that stapling operation is not performed.

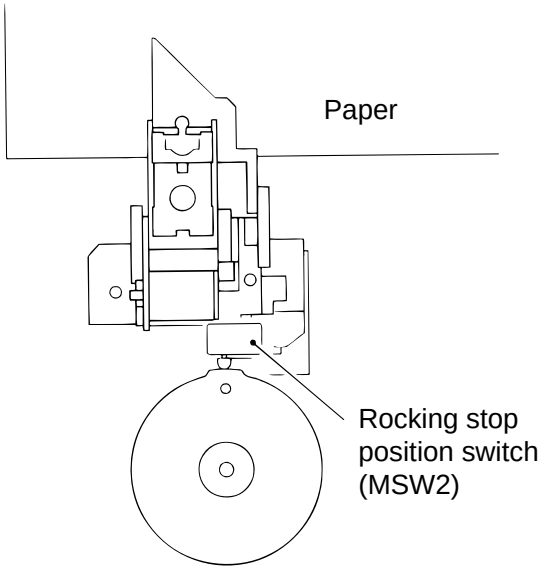


5) Rocking stop position sensor (MSW2)

When the stapler unit comes to the specified position when it performs rocking operation, the rocking stop position sensor is turned on. When the rocking stop position sensor is turned on, the drive power (24V) for the staple motor (M2) is supplied, so that stapling operation may be performed.



Not in stapling position



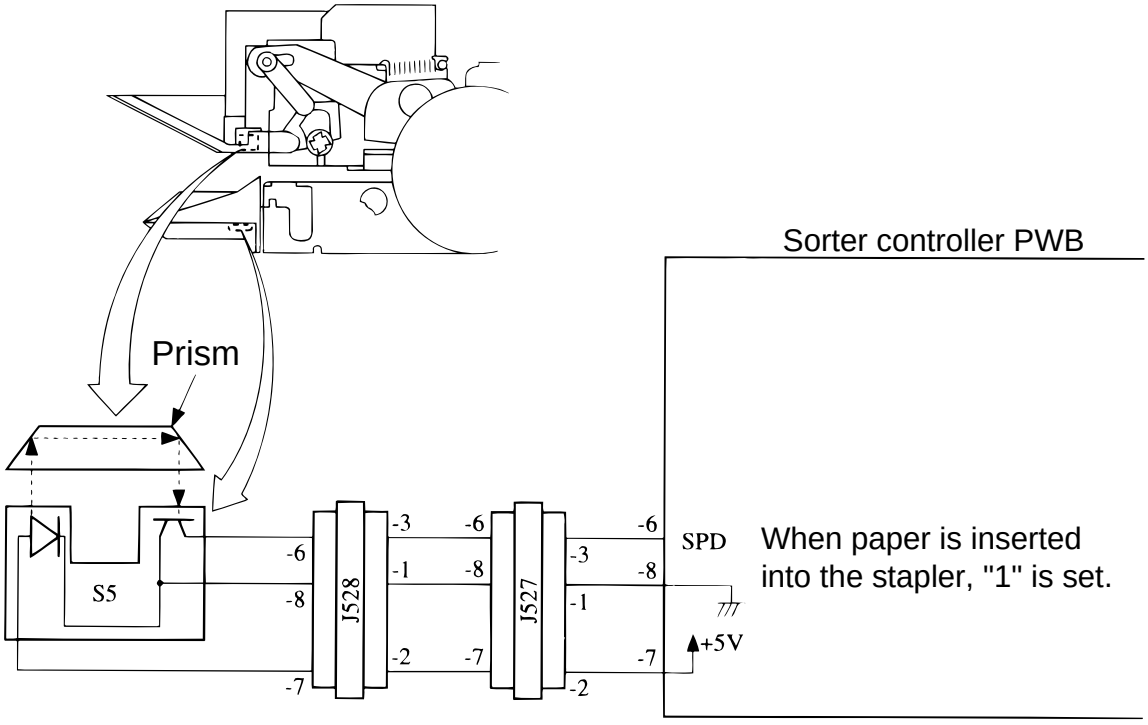
In stapling position

6) In-stapler paper sensor (S5)

The stapler unit is provided with the in-stapler paper sensor (S5) which detects existence/nonexistence of paper.

The in-stapler paper sensor (S5) is a reflection transmission type sensor using a prism. This sensor detects existence/nonexistence of paper, and sends the result to the microcomputer (Q1) provided on the sorter controller PWB.

Only when the microcomputer (Q1) received the "paper existing" signal, it drives the staple motor (M2).



7) Staple nonexistence detection

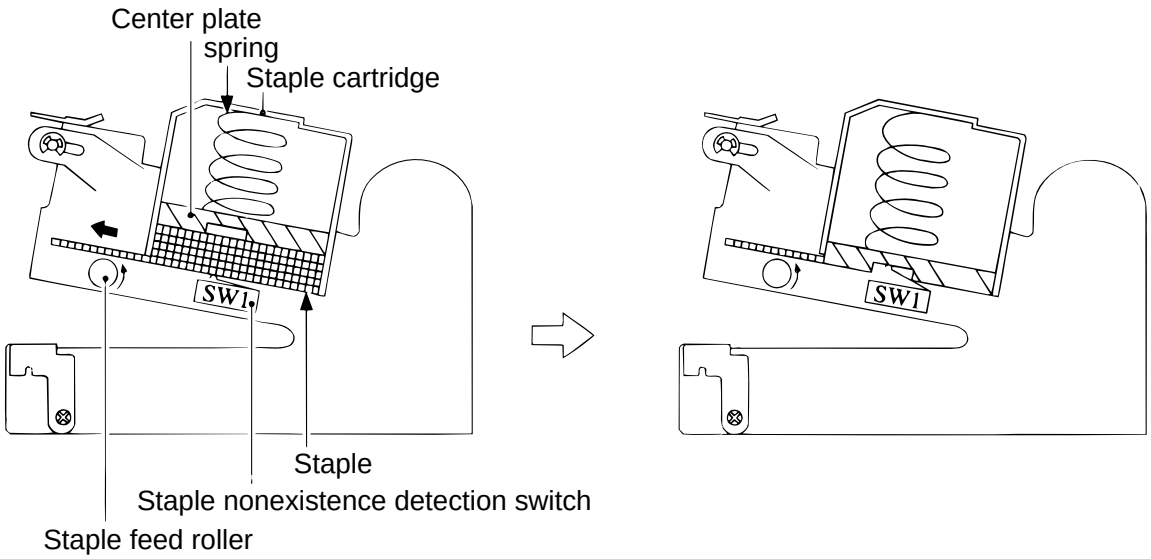
Nonexistence of staple in the staple cartridge is detected by the staple nonexistence detection switch (MS1) provided in the bottom of stapler.

The staple in the staple cartridge is pressed downward by the spring and center plate. Staple is sent toward the front of stapler by the staple feed roller.

While staples remain, the staple pushes the staple nonexistence detection switch (MS1), so that the sorter controller recognizes that staple exists.

When staples have run out (about 40 staples remain), the staple nonexistence detection switch (MS1) is opened (MS1 is normally closed), so that the sorter controller detects nonexistence of staples. At the same time, the sorter controller lights the staple replenishment indication.

After staple nonexistence is detected, subsequent stapling operation is not performed. If staple nonexistence was detected during continuous stapling, stapling is continued to the end.



Staple existence detecting state

Staple nonexistence detecting state

(3) Stapler unit direction change control

1) Outline

The direction of stapler unit is changed according to the stapling method to be applied.

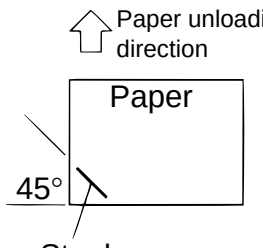
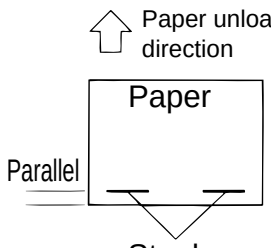
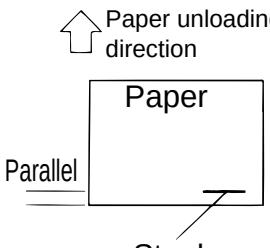
The stapler unit can have the two directions shown below.

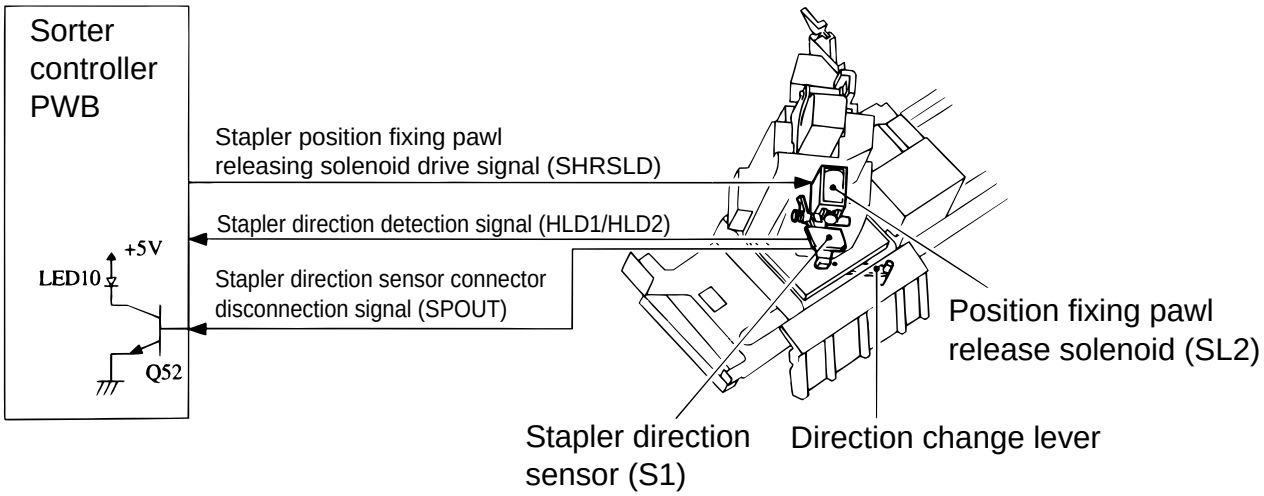
The direction of stapler unit is changed by using the direction change lever when the stapler unit moves toward the rear side.

The direction of stapler unit is tilted by 45˚ with respect to paper when it is in its home position. When it moves for about 100 mm toward the rear side from its home position, it is set parallel with the paper.

The stapler unit is fixed by the position fixing pawl in specific position. The position fixing pawl is released by the position fixing pawl releasing solenoid (SL2).

The stapler direction sensor (S1) is provided to detect direction of stapler unit.

No.	1	2	
Stapling method	45° with respect to paper	Parallel with paper	
Figure	 (Corner stapling)	 (Double stapling)	 (Single stapling)

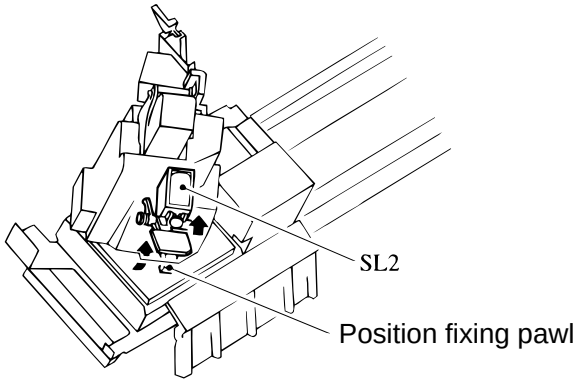

Sorter controller PWB
Stapler position fixing pawl releasing solenoid drive signal (SHRSLD)
Stapler direction detection signal (HLD1/HLD2)
+5V
LED10
Stapler direction sensor connector disconnection signal (SPOUT)
Q52
Position fixing pawl release solenoid (SL2)
Stapler direction sensor (S1)
Direction change lever

2) Operation

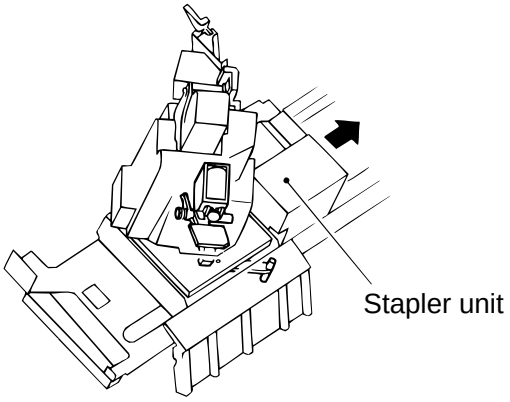
The sorter controller PWB sends the drive signal (HLDSLD) to the position fixing pawl release solenoid (SL2) to release the position fixing pawl. After that, the stapler unit starts to move toward the rear side. When the stapler unit starts to move toward the rear side, the direction change lever is detached from the rail. As a result, the stapler unit is turned by 45˚ counterclockwise, so that it is set in the double stapling and single stapling position.

The position fixing pawl is automatically engaged after the staple unit is set in the specific direction, so that the stapler unit is fixed.

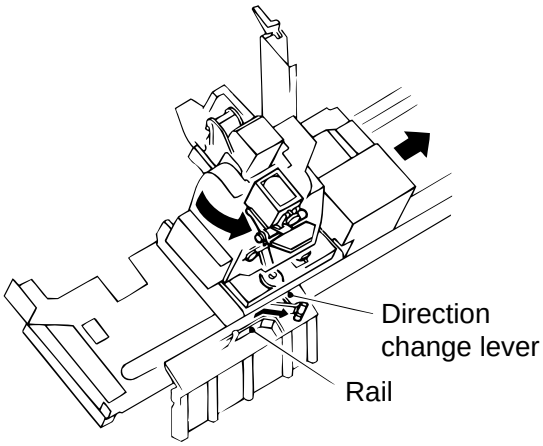
1) The position fixing pawl release solenoid (SL2) is turned on, and the position fixing pawl is disengaged.



2) The stapler unit starts to move toward the rear side.



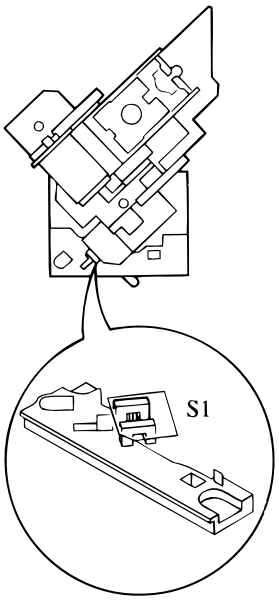
3) The direction change lever is detached from the rail, and the stapler unit is turned by 45˚ counterclockwise.



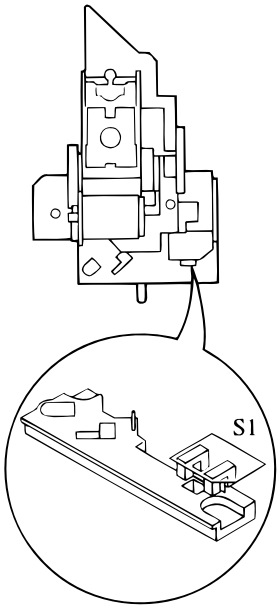
3) Stapler unit direction detection

The stapler unit is provided with the stapler direction sensor (S1) to detect direction of stapler unit.

The stapler direction sensor (S1) consists of two photointerrupters. Each photointerrupter detects that the direction of stapler unit with respect to the paper is 45° (corner stapling position) or 90¯ (double/single stapling position), and sends the obtained data to the microcomputer provided on the sorter controller PWB.

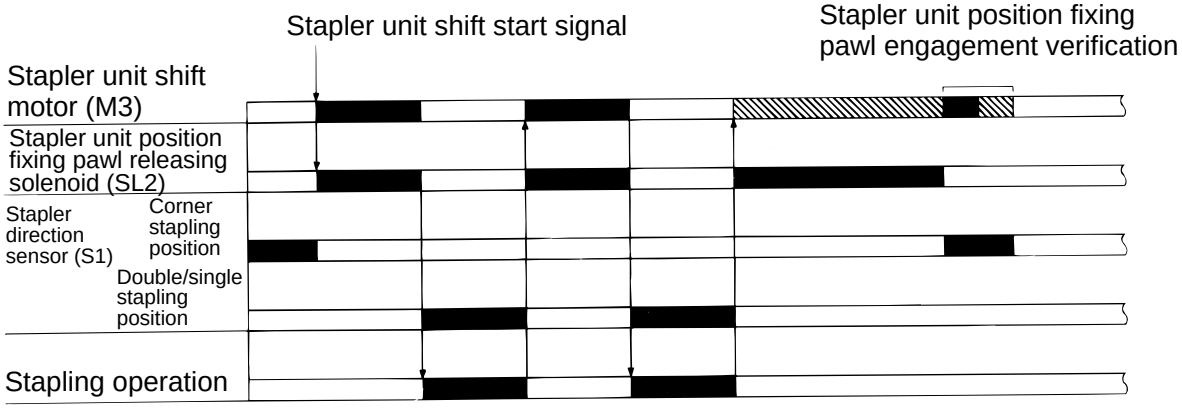


(Corner stapling)



(Double/single stapling)

4) Stapler unit direction change operation timing chart (Double stapling)


Stapler unit shift start signal
Stapler unit position fixing pawl engagement verification
Stapler unit shift motor (M3)
Stapler unit position fixing pawl releasing solenoid (SL2)
Stapler direction sensor (S1)
Corner stapling position
Double/single stapling position
Stapling operation

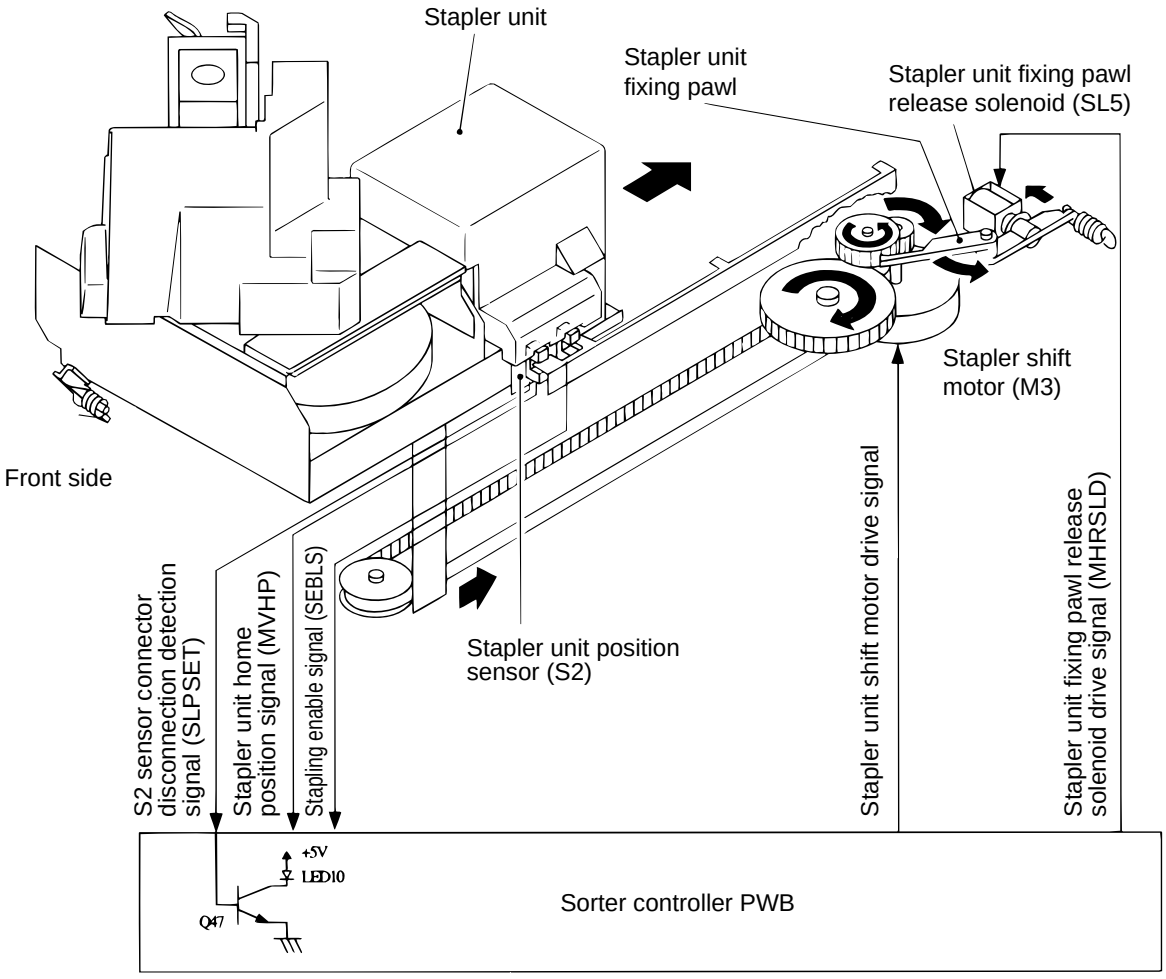
(4) Stapler unit shift control

1) Outline

The stapler unit is shifted toward the rear side to perform single stapling and double stapling.

The staple shift motor (M3) is used for shift. The stapler unit position sensor (S2) is provided to detect the home position and stapling position of stapler unit.

While the stapler unit is in its home position, it is fixed with the stapler unit fixing pawl. When it is shifted, the fixing pawl release solenoid (SL5) is turned on to disengage the fixing pawl.


Stapler unit
Stapler unit fixing pawl
Stapler unit fixing pawl release solenoid (SL5)
Stapler shift motor (M3)
Front side
S2 sensor connector disconnection detection signal (SLPSET)
Stapler unit home position signal (MVHP)
Stapling enable signal (SEBLS)
Stapler unit position sensor (S2)
Stapler unit shift motor drive signal
Stapler unit fixing pawl release solenoid drive signal (MHRSLD)
+5V
LED10
Q47
Sorter controller PWB

2) Operation

The stapler unit is shifted only when single stapling or double stapling is performed. It is not shifted when corner stapling is performed.

Receiving the signal from the sorter controller PWB, the stapler unit shift motor (M3) shifts the stapler unit to the specified position. It has two stop positions excepting its home position.

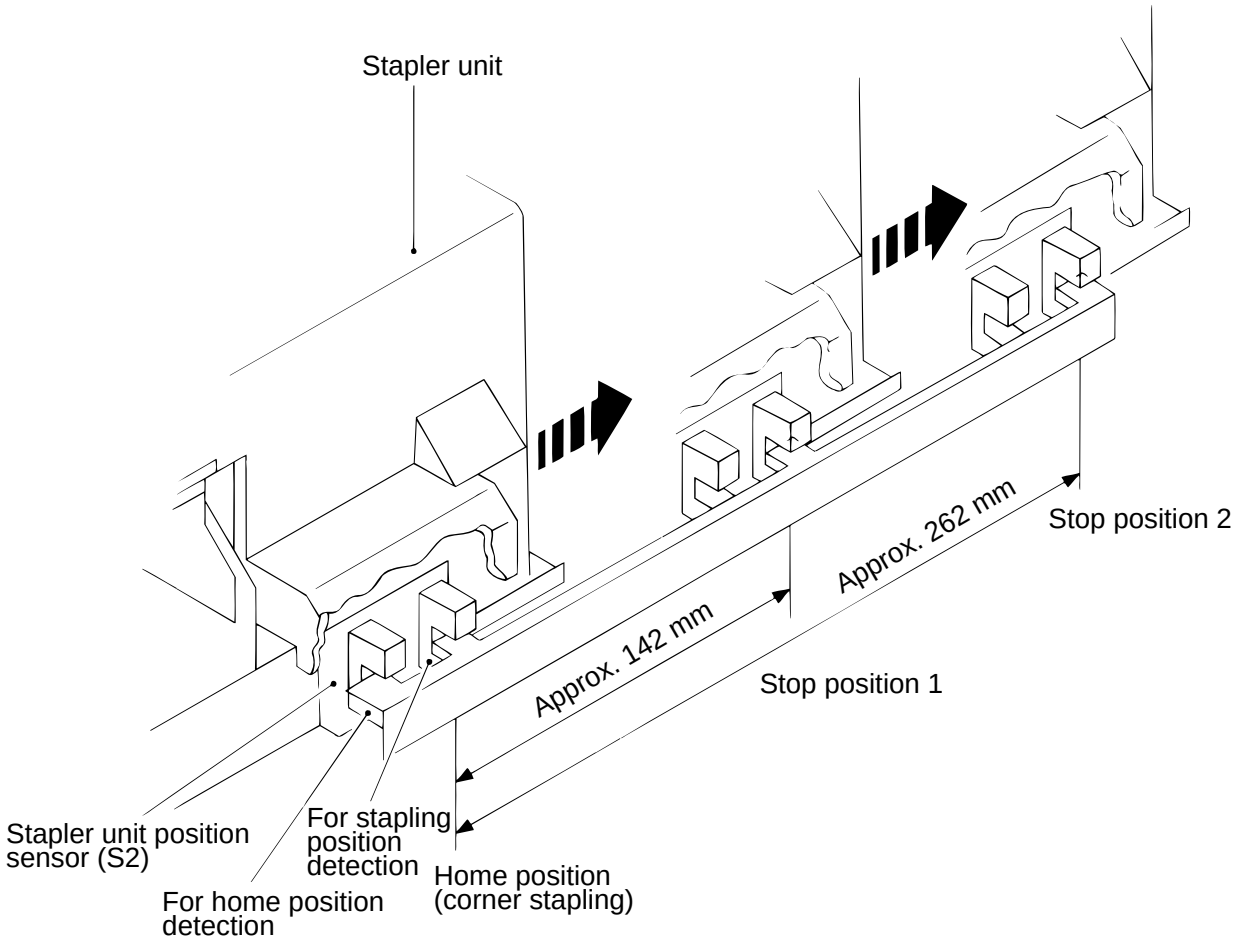
Stop position	Distance from home position
Stop position 1	Approx. 142 mm
Stop position 2	Approx. 262 mm

(Reference data)

3) Stop position detection

The stapler unit stop position is detected by the stapler unit position sensor (S2). This sensor consists of two photointurupters. The sensors detect the home position and stapling position.

These functions are intended to ensure stapling only in correct position. When the staples unit position sensor (S2) is turned on, the staple enable signal (SEBL) is generated, thereby enabling stapling operation.

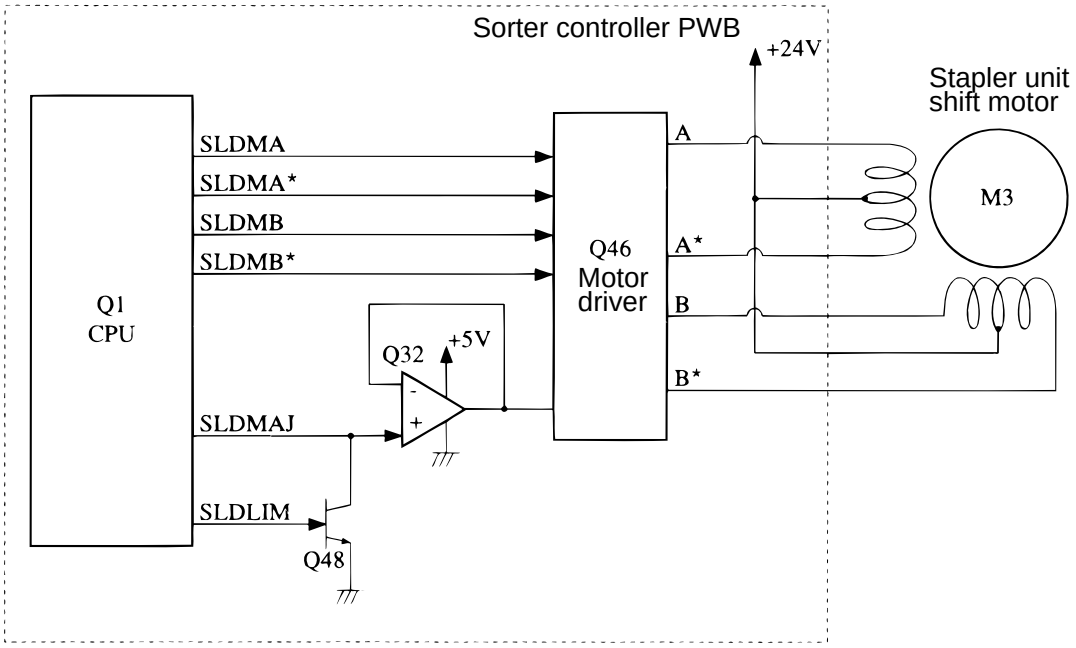


4) Stapler unit shift motor control

a. Outline

Below shown is the stapler unit shift motor (M3) control circuit.

The stapler unit shift motor is a 4-phase control stepping motor. The stapler unit shift motor (M3) ON/OFF and rotation direction is changed by controlling the output timing of pulse signals A, A*, B, B*.



b. Operation

The microcomputer (Q1) provided on the sorter controller PWB receives instructions of staple mode from the copying machine. The microcomputer (Q1) sends the drive pulses (SLDMA, SLDMA*, SLDMB, SLDMB*) and the reference current signal (SLDMAJ) to the motor driver circuit.

The motor driver circuit drives the stapler unit shift motor (M3) according to the signals.

When the stapler unit shift motor (M3) is in HOLD state, the output timing of pulse signals A, A*, B, B* is fixed, and the level of reference current signal (SLDMAJ) is changed for HOLD.

The stapler unit shift prohibition signal (SLDLIM) is a signal to set the reference current signal (SLDMAJ) to "0". When the reference current signal (SLDMAJ) has been set to "0", the stapler unit shift motor (M3) does not drive.

When the operation prohibition signal (SLDLIM) has been generated, the LED 4 provided on the sorter controller PWB lights.

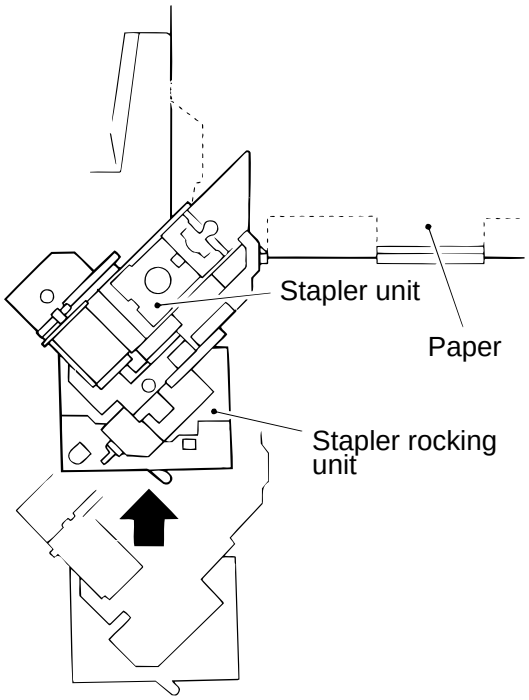
(5) Stapler unit rocking control

1) Outline

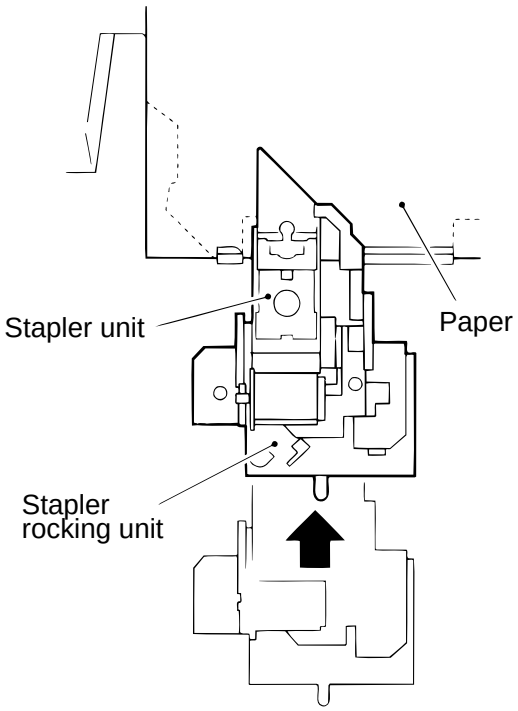
The stapler unit is rocked as shown below so that the stapler unit does not contact paper in the bin when the bin is shifted.

The stapler unit rocking motor (M4) is used for rocking operation. When the stapler unit reaches the stapling position, the rocking stop position sensor (MSW2) is turned on, and power is supplied to the staple motor. (Details are explained in section 2-33.)

The stapler unit rocking home position sensor (PI9) and the stapler unit rocking position sensor (PI10) are provided to detect the stapler unit rocking position.

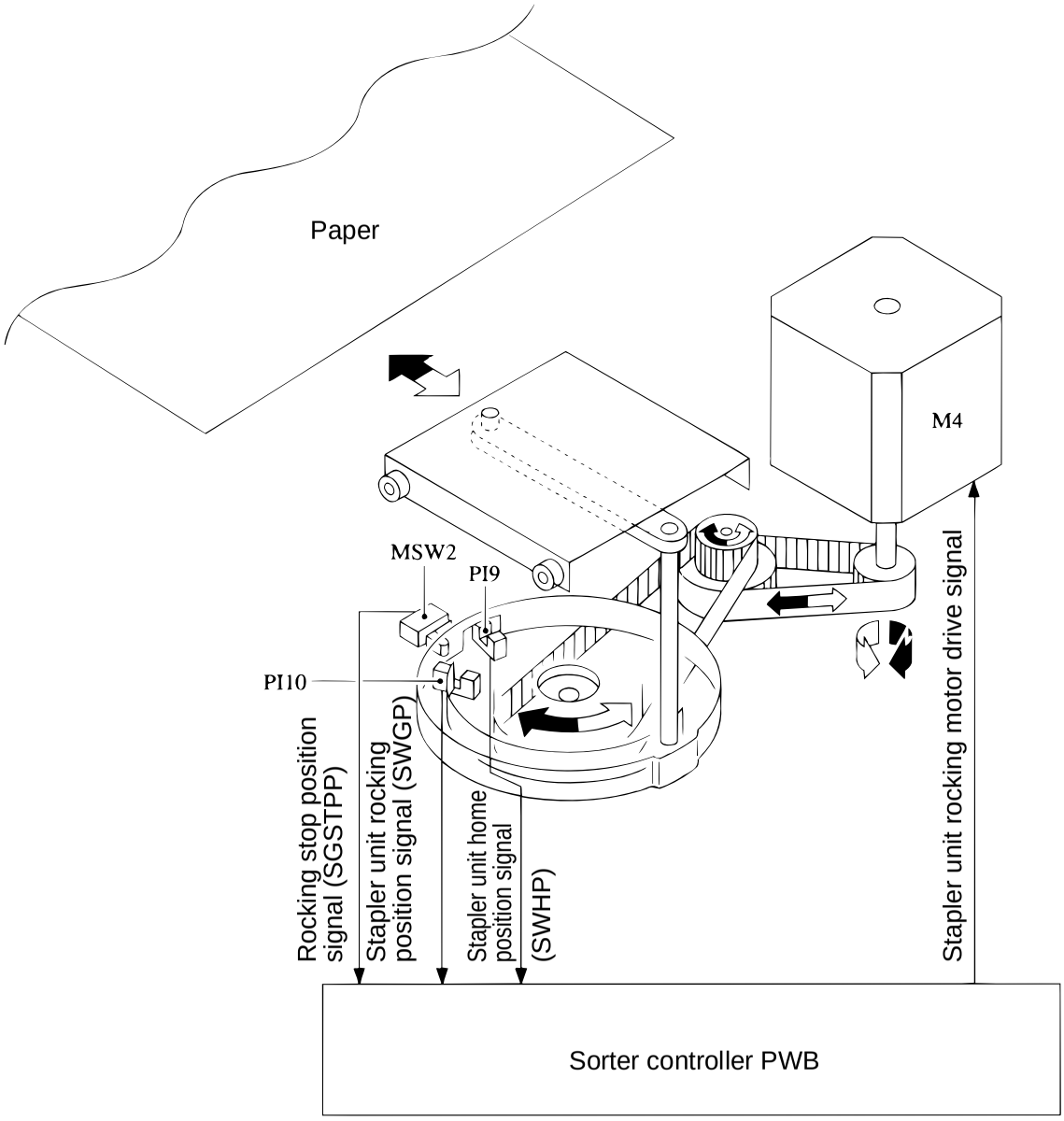


(Rocking operation in corner stapling mode)



(Rocking operation in single/double stapling mode)

Top view


Paper
M4
MSW2
PI9
PI10
Rocking stop position signal (SGSTPP)
Stapler unit rocking position signal (SWGP)
Stapler unit home position signal (SWHP)
Stapler unit rocking motor drive signal
Sorter controller PWB

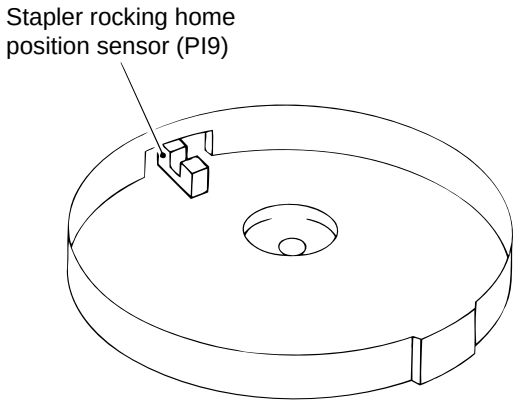
2) Stapler unit position detection

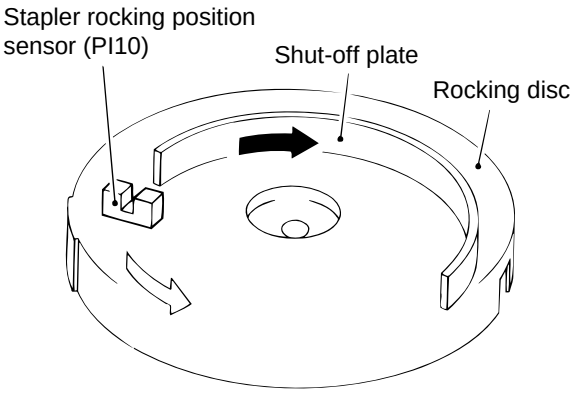
The stapler rocking home position sensor (PI9) and the stapler rocking position sensor (PI10) are used to detect the position of stapler unit.

The stapler rocking home position sensor (PI9) detects that the stapler unit is in its home position.

The stapler rocking position sensor (PI10) detects the position of stapler unit and informs the sorter controller PWB of shortest return route (return to home position). The sorter controller PWB turns forward or reverses the stapler unit rocking motor (M4) according to the signal from the stapler rocking position sensor (PI10).

The rocking disc is rotated in the direction ⇨, when the stapler rocking position sensor (PI10) is shut off by the shut-off plate. Unless the stapler rocking position sensor (PI10) is shielded by the shut-off plate, the rocking disc is rotated in the arrow direction.



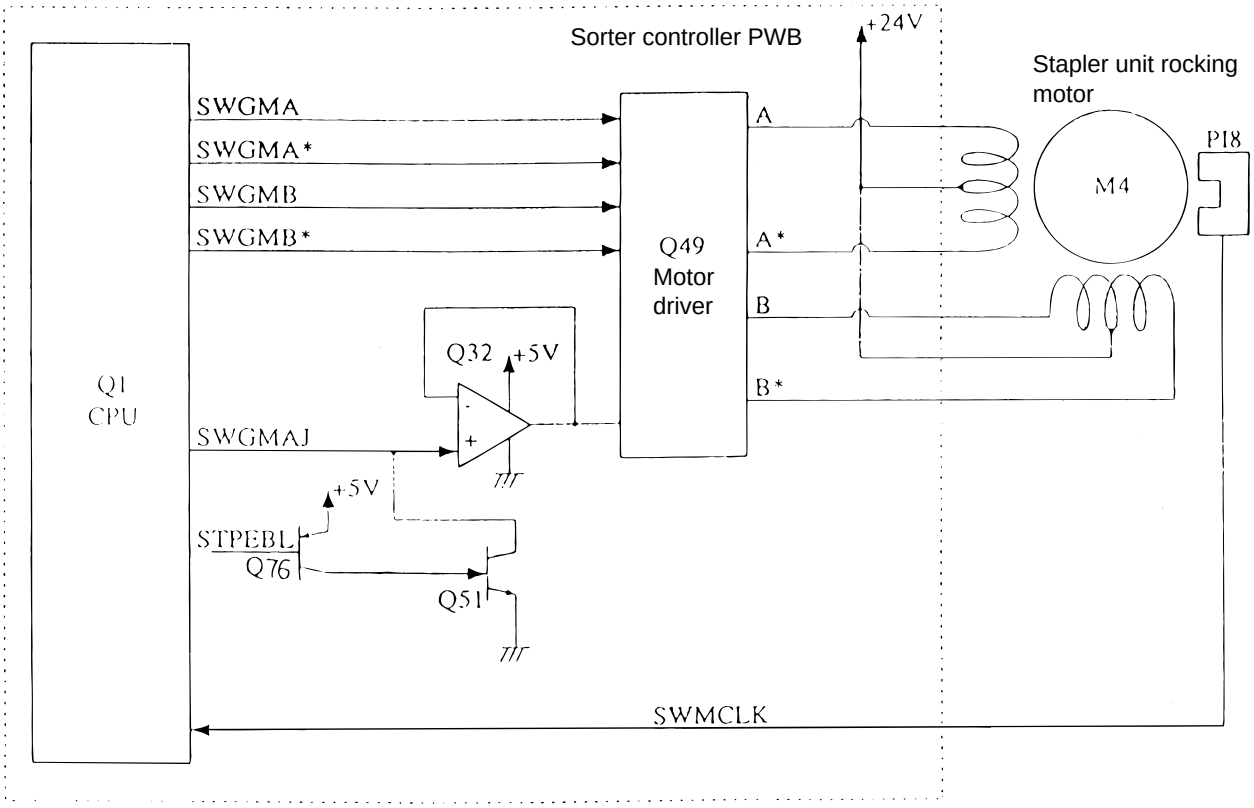


3) Stapler unit rocking motor control

a. Outline

The stapler unit rocking motor is a 4-phase control stepping motor. The stapler unit rocking motor (M4) ON/OFF and rotation direction are changed by controlling the output timing of pulse signals A, A*, B, B*.

The stapler unit rocking motor can be driven when the rocking enable signal (SWEBL) is generated.



b. Operation

he microcomputer (Q1) provided on the sorter controller PWB receives instructions of staple mode from the copying machine. The microcomputer (Q1) sends the drive pulses (SWGMA, SWGMA*, SWGMB, SWGMB*) and the reference current signal (SWGMAJ) to the motor driver circuit.

The motor driver circuit drives the stapler unit shift motor (M4) according to the signals.

When the stapler unit rocking motor (M4) is in HOLD state, the output timing of pulse signals A, A*, B, B* is fixed, and the level of reference current signal (SWGMAJ) is changed for HOLD.

The reference current signal (SWGMAJ) is set to "1" only when the stapling enable signal (STPEBL) is generated and sent to the motor driver. When the reference current signal (SWGMAJ) is set to "0", the stapler unit rocking motor (M4) is not driven.

(6) Smooth stapling

1) Outline

The former stapling operation has been designed so that the shift of bin unit was stopped during rocking of stapler.

The machine of new model enabling smooth stapling is designed so that the stapler rocking is synchronized with the bin unit shift so as to reduce stapling operation time.

As a result the stapling time is reduced by 30% as compared to the former model.

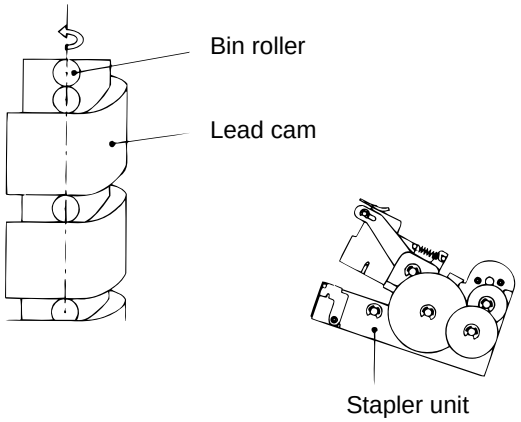
The smooth stapling is enabled in the following conditions.

a. In case of auto-stapling or manual stapling the number of bins for stapling must be 2 or more.

2) Operation

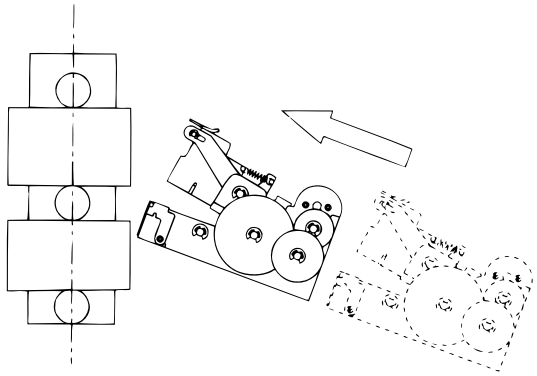
Step 1

After the paper unloading operation is completed and the staple request signal is sent to the machine, the machine turns about 90¯ the lead cam so as to stop the bin roller in the center of horizontal part of lead cam.



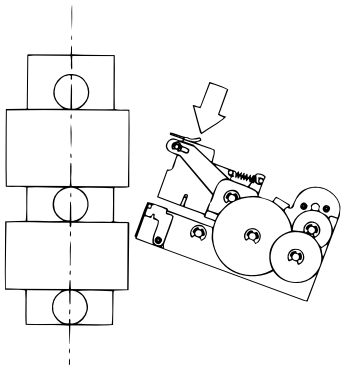
Step 2

The stapler unit rocking motor is driven, and the stapler unit is shifted to the stapling position.



Step 3

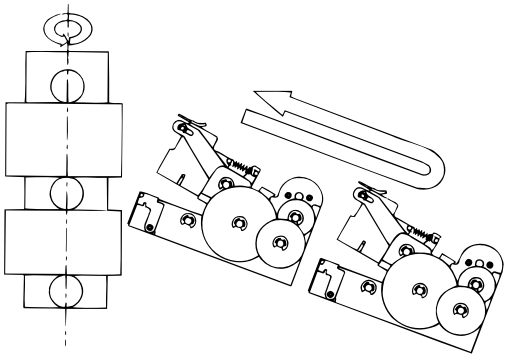
Stapling is performed.



Step 4

After completion of stapling the stapler unit rocking motor and the bin shift motor are driven at the same time.

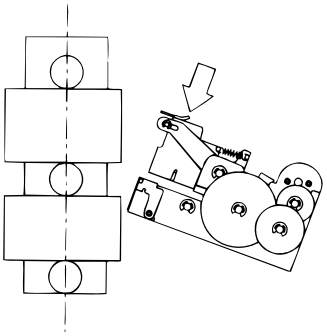
* The stapler unit moves backward, shifting to the stapling position for the next staple.
* The bin unit is moved up or down to access to the next staple.



Step 5

The stapler unit rocking motor stops, and the stapler unit begins stapling.

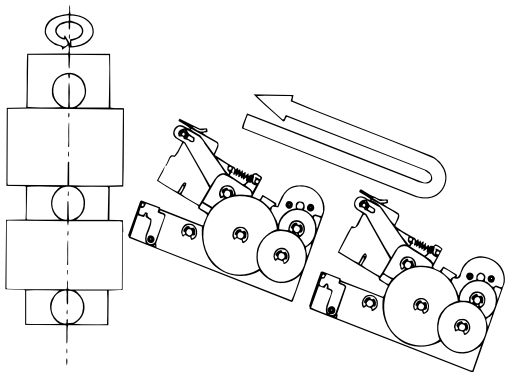
Although the bin shift motor is running, the bin is at rest because the rotating bin exists on the lead cam parallel part.



Step 6

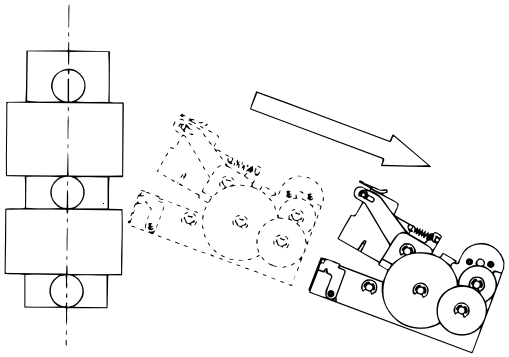
After completion of stapling the stapler unit rocking motor and the bin shift motor are driven at the same time.

* The stapler unit moves backward, shifting to the stapling position for the next staple.
* The bin unit moves up or down for the next stapling.



Step 7

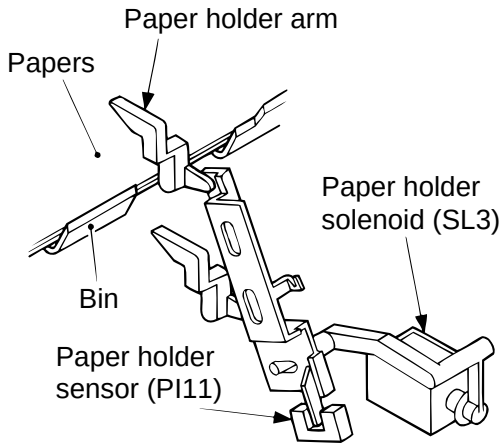
After completion of all intended operations the stapler unit returns to the home position of rocking operation.



(7) Operation of paper holder

1) Outline

When papers are stapled, these papers are held by the guide bar at a side and by the paper holder arm from above so that deviation of papers to be stapled is reduced.

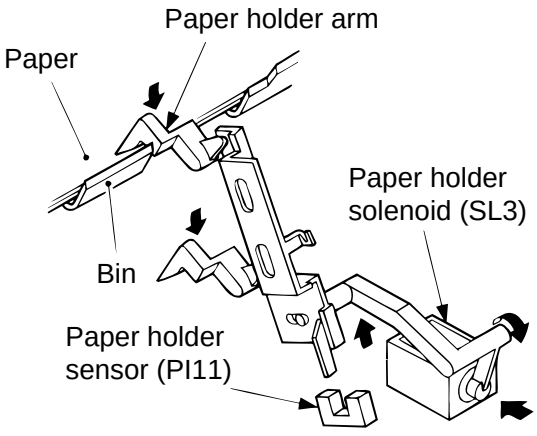


(SL3 OFF)

2) Paper holder solenoid

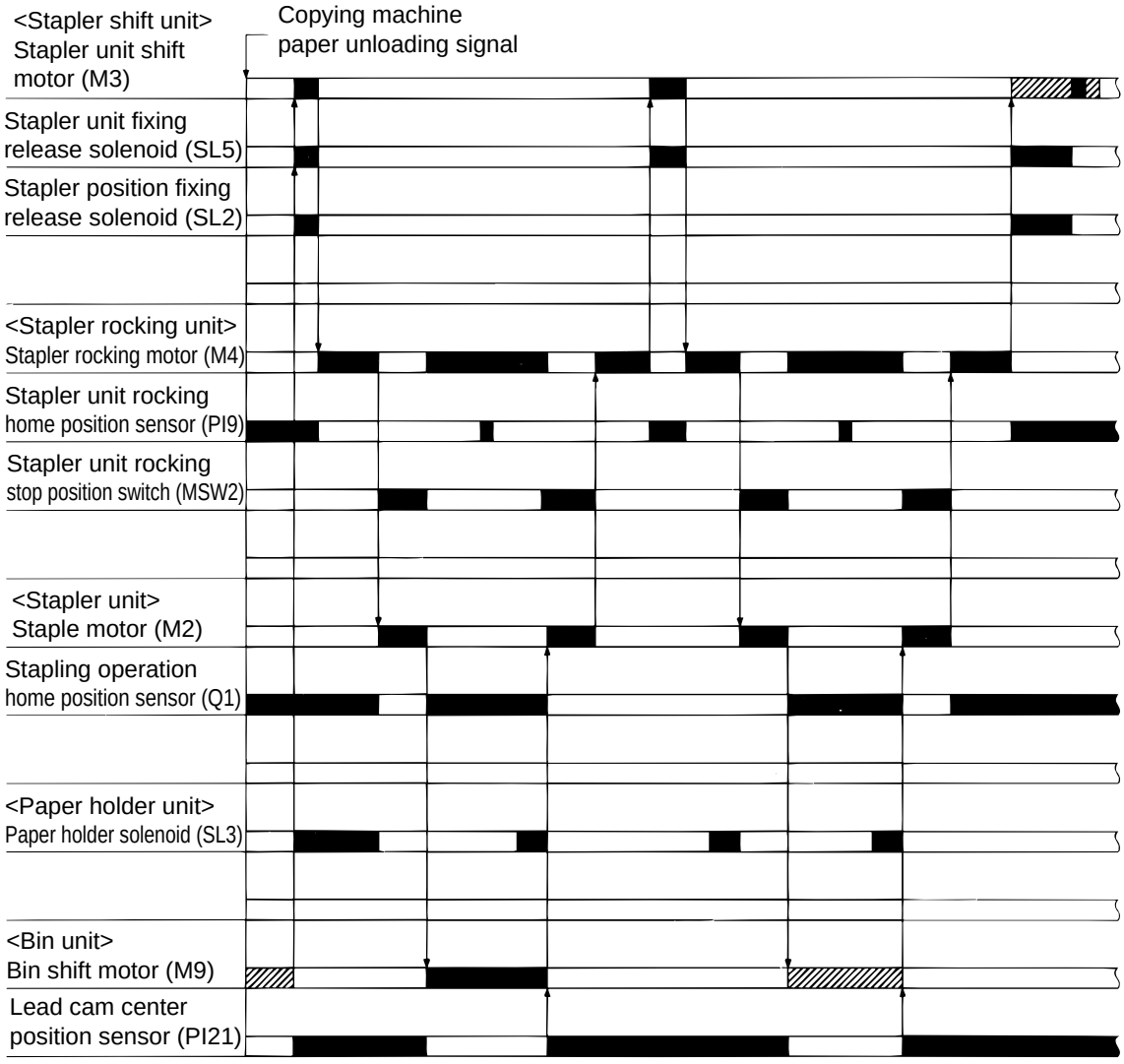
When the paper holder solenoid (SL3) is turned on, the paper holder arm is driven to hold the papers on the bin. When the bin is shifted while the paper holder arm is in driving state, the paper holder arm may be damaged.

Hence, the paper holder sensor (PI11) is turned off while the paper holder arm exists on the bin, so that the bin shift motor operation prohibition signal (SFTLIM) is generated. When the bin shift motor operation prohibition signal (SFTLIM) is generated, the bin shift motor cannot be driven.



(SL3 ON)

(8) Stapling operation timing (two-sheet original double stapling)

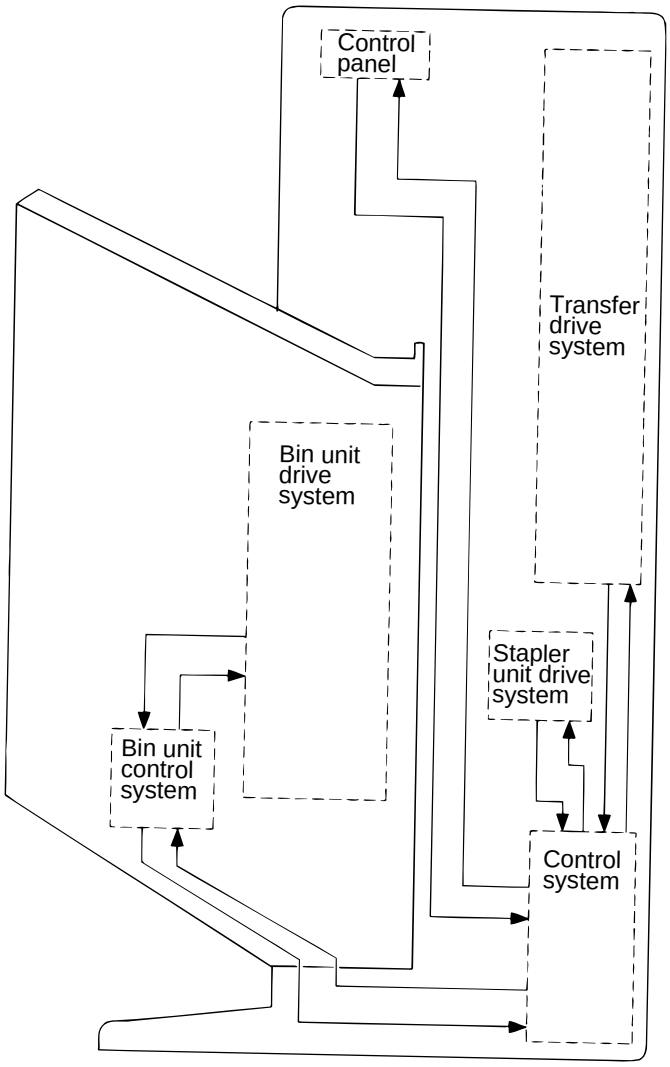


: Motor reversing

4. Functions of electric circuit

A. Block diagram

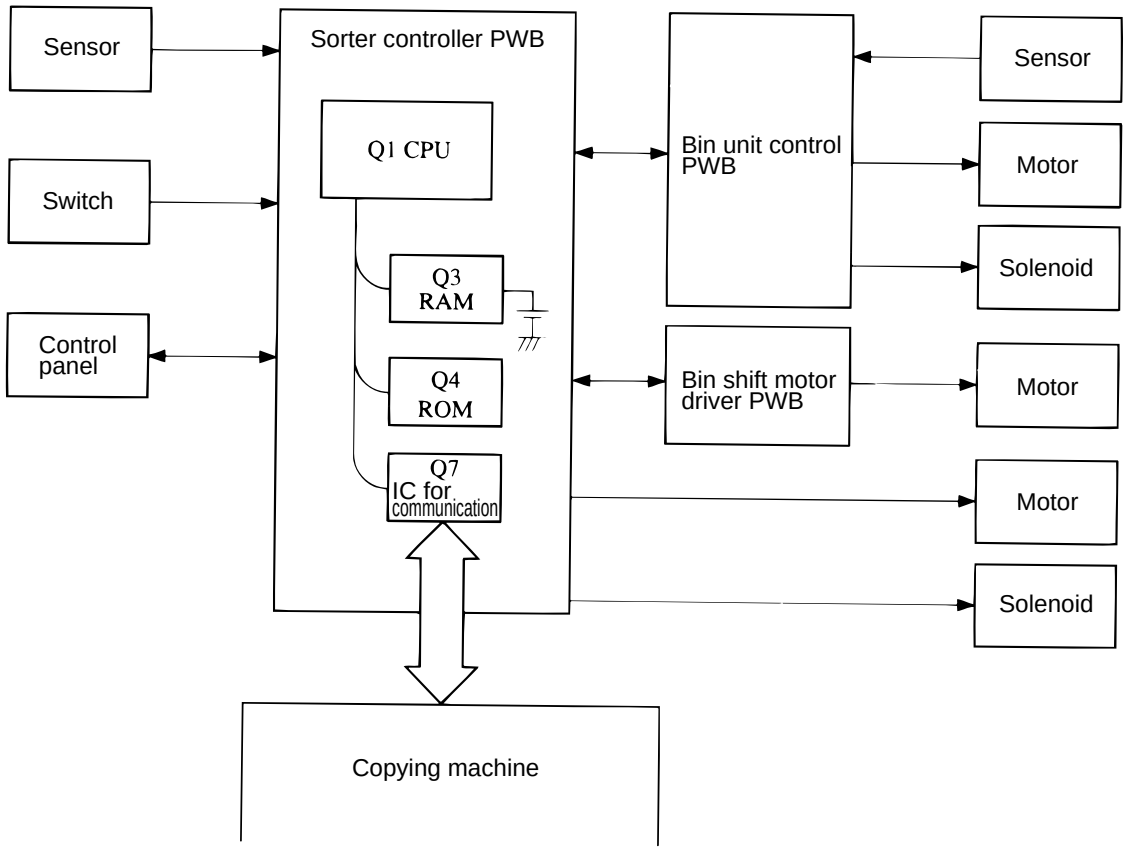
The machine is mainly composed of 6 blocks, namely control panel, transfer drive system, bin unit drive system, stapler unit drive system, bin unit control system, and control system.



B. Outline

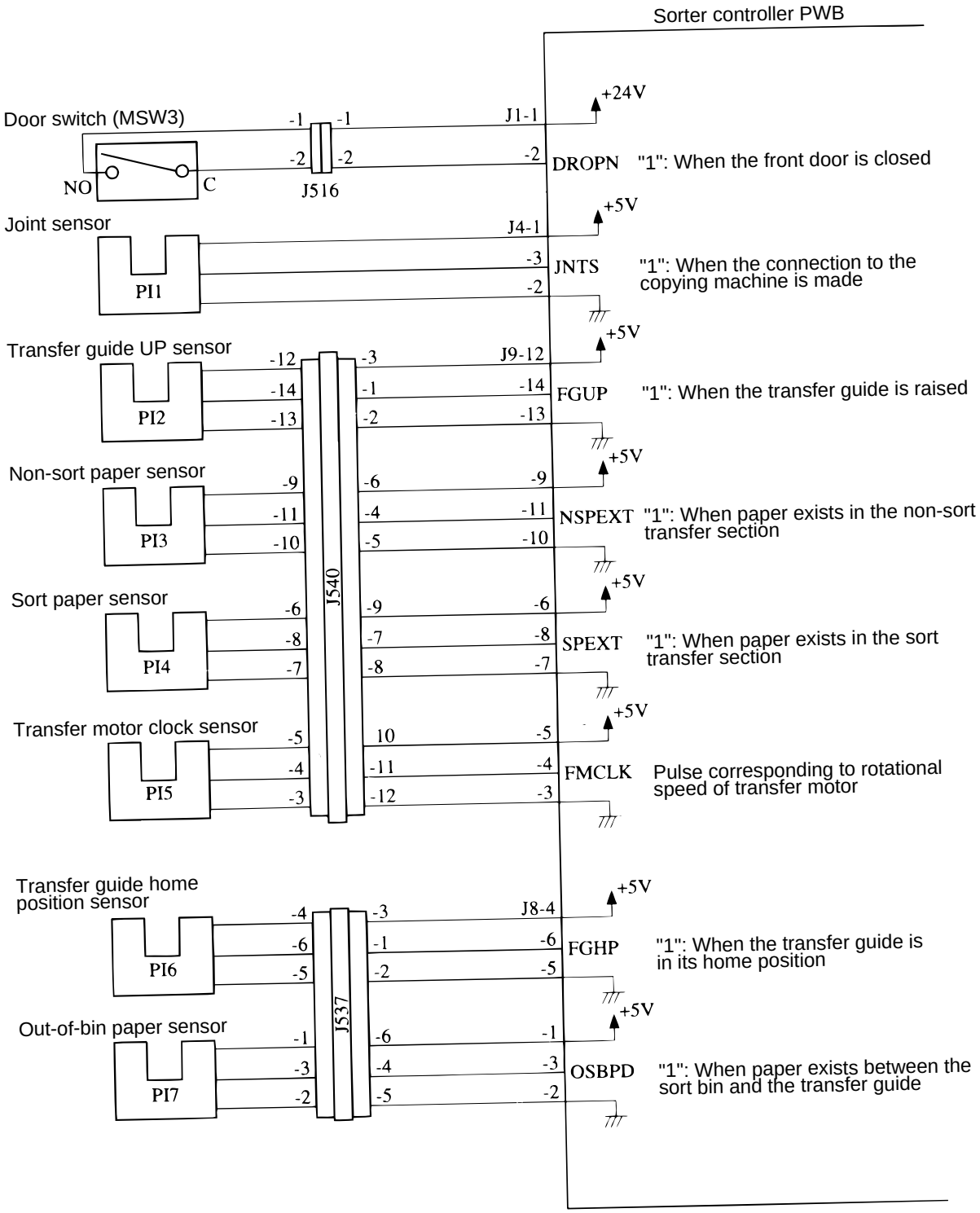
The machine is controlled electrically by the sorter controller. The main functions of IC of the sorter controller in this machine are as follows.

Mark	Functions
Q1	Sequence control
Q3	Sensor adjustment values, operation modes, etc.
Q4	Storage of sequence program
Q7	Control of communication with copying machine

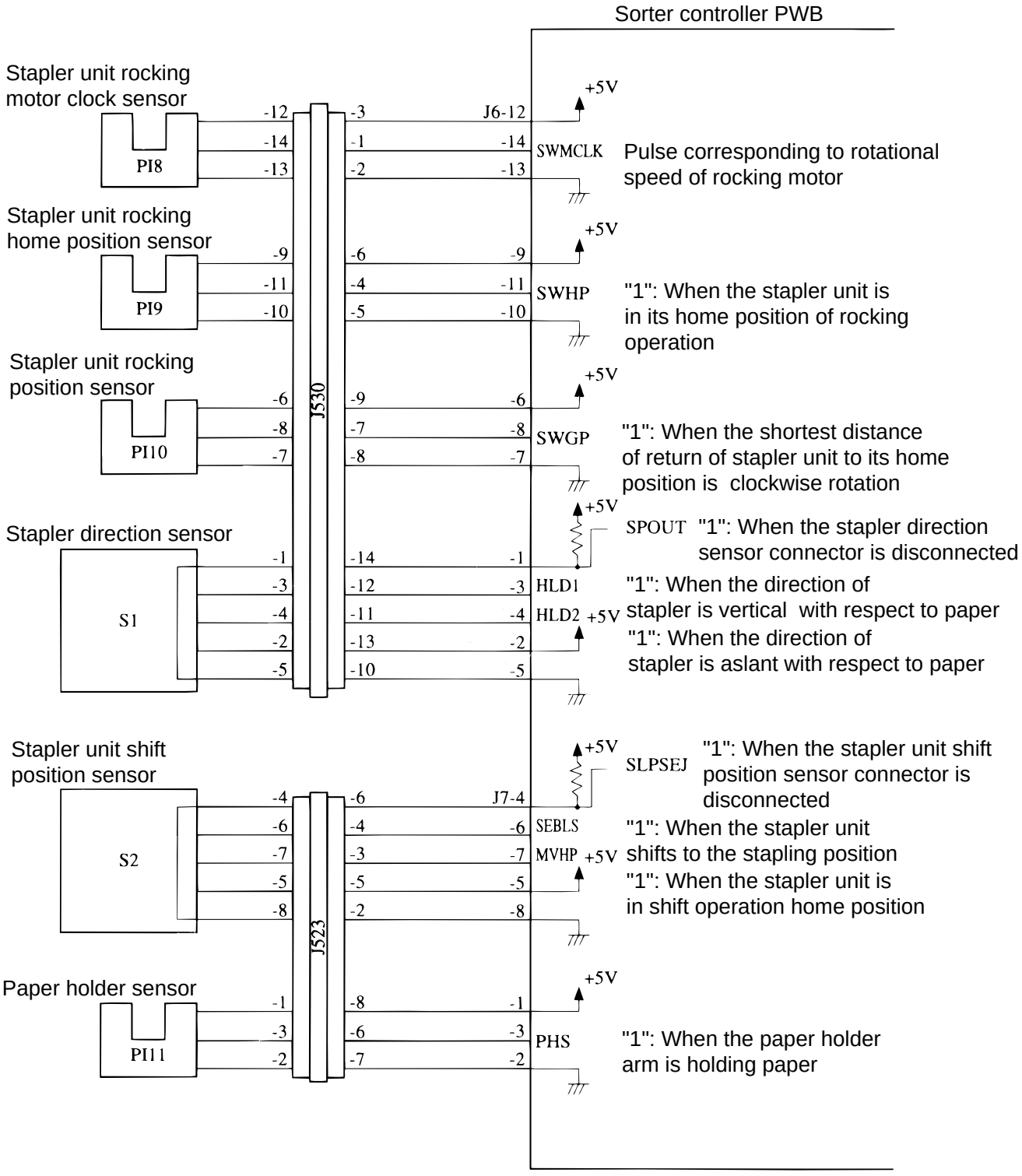


C. Sensors, detectors and switch circuit

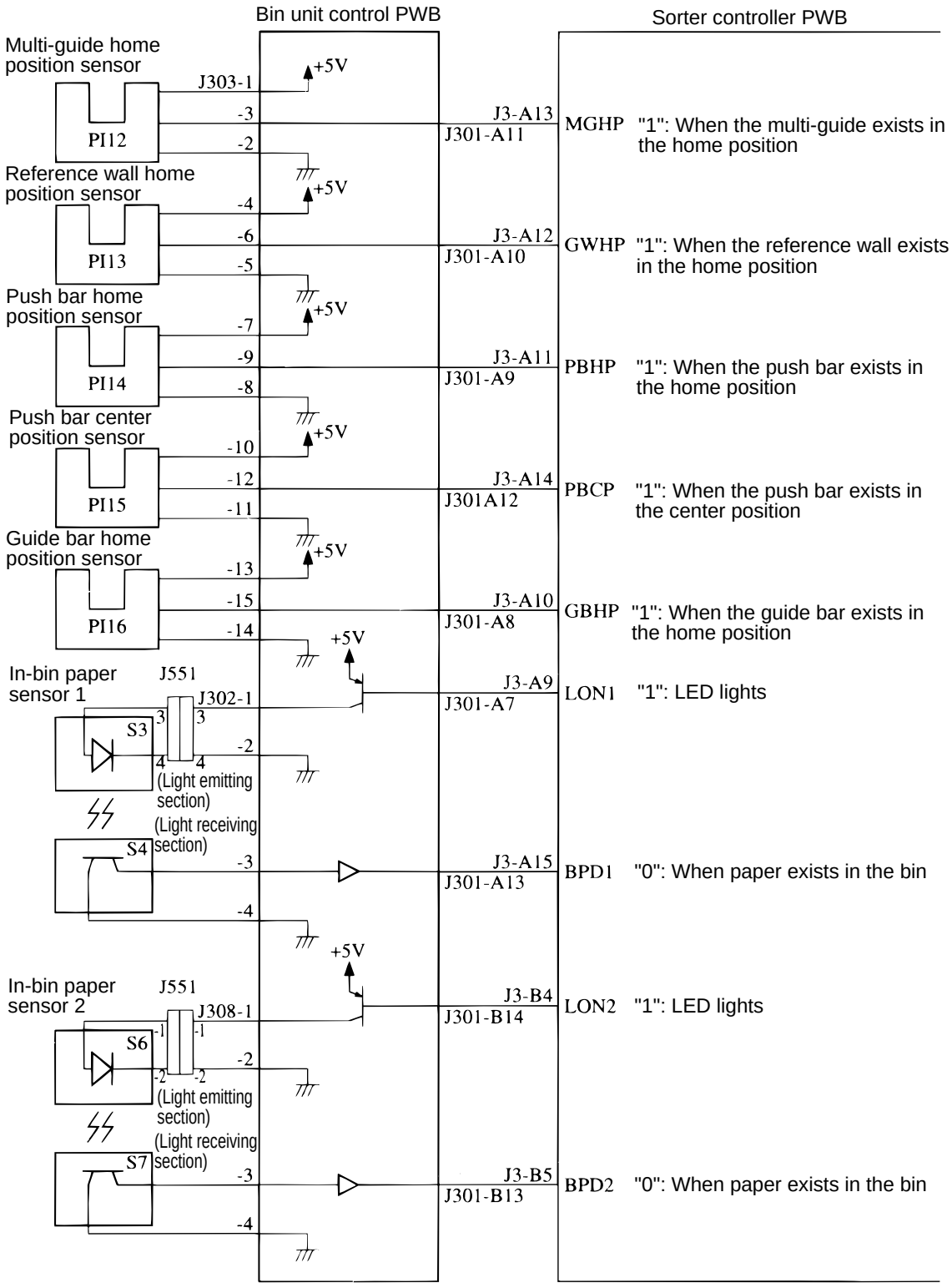
(1) Sorter controller input (1/4)



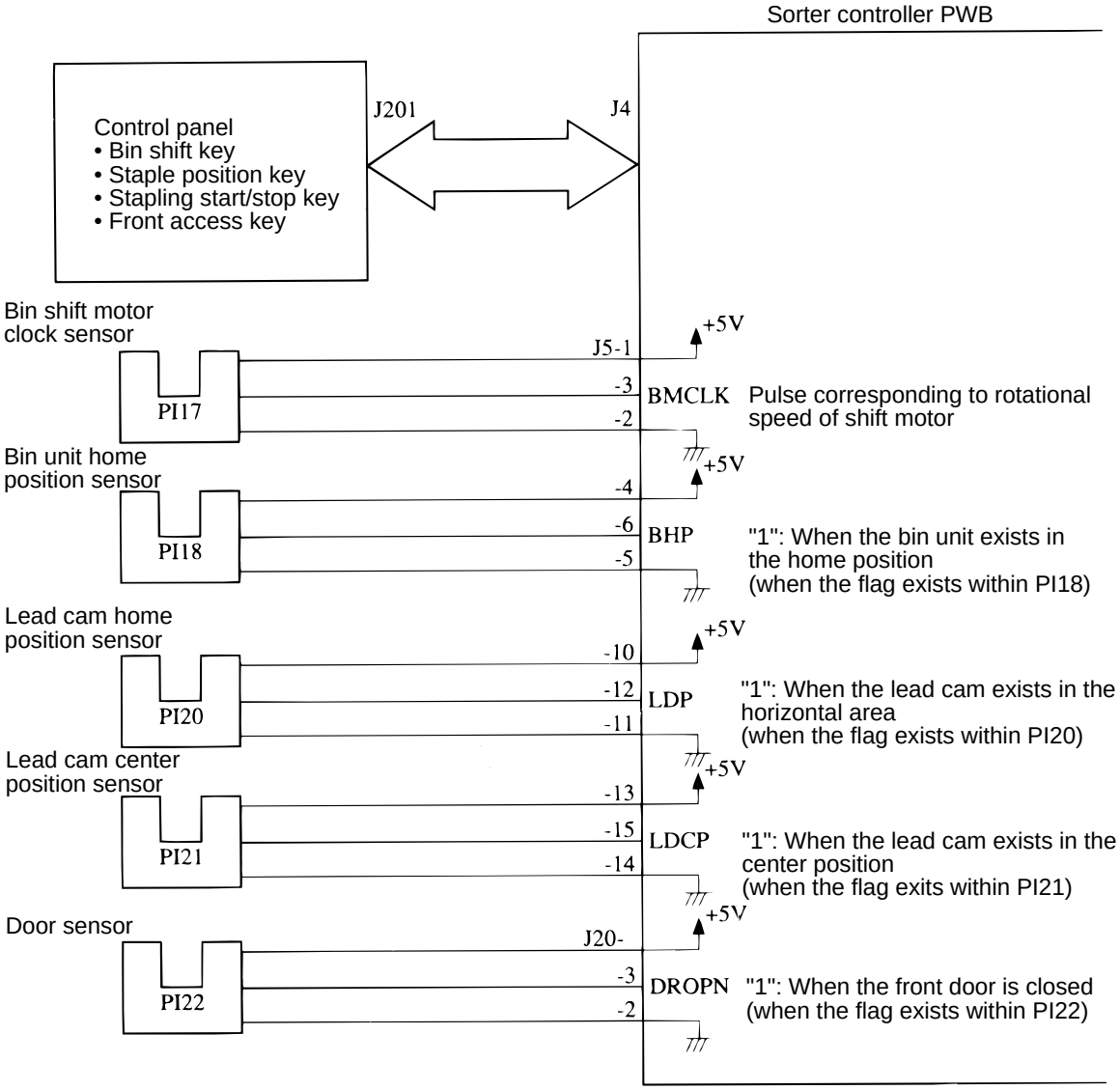
(2) Sorter controller input (2/4)



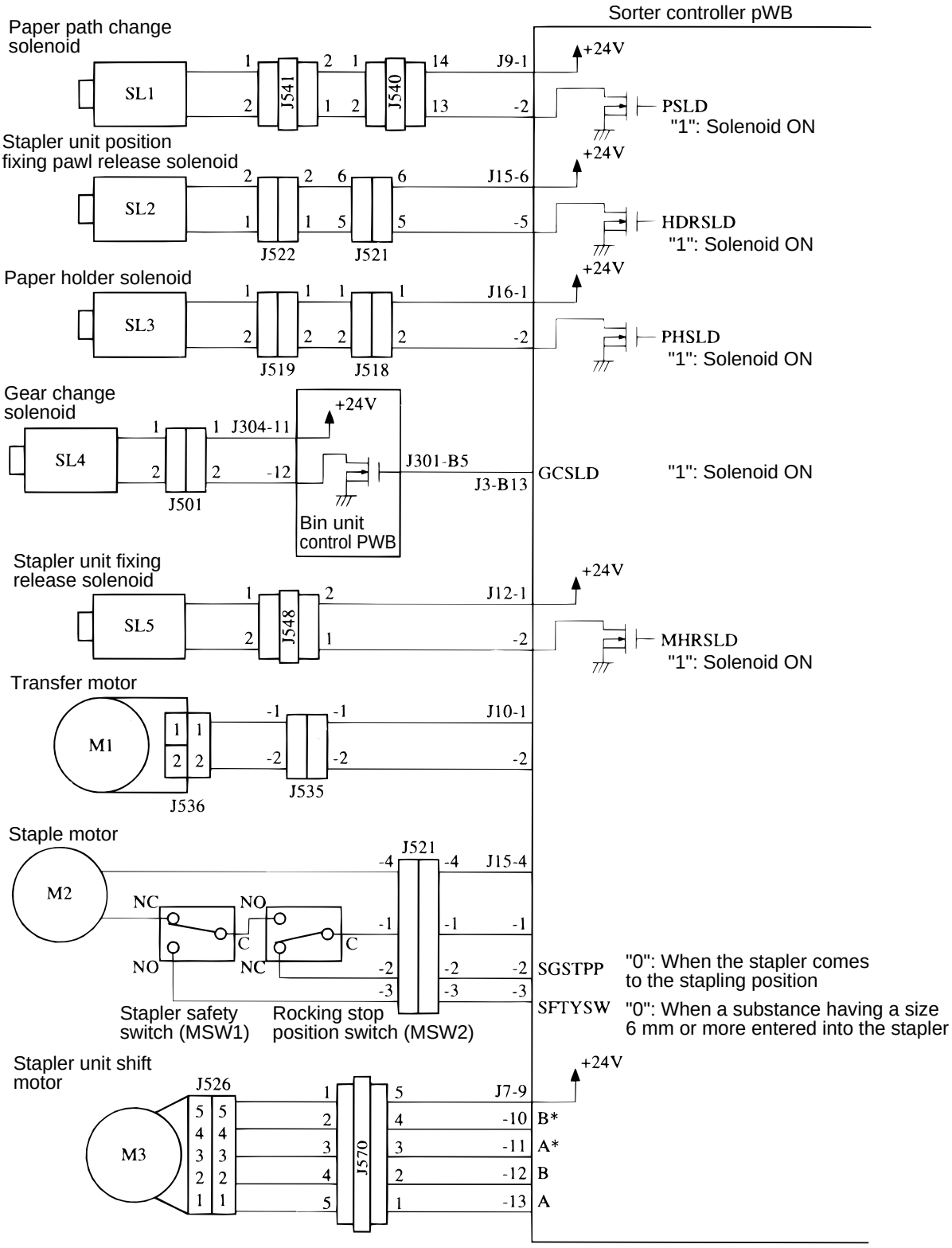
(3) Sorter controller input (3/4)

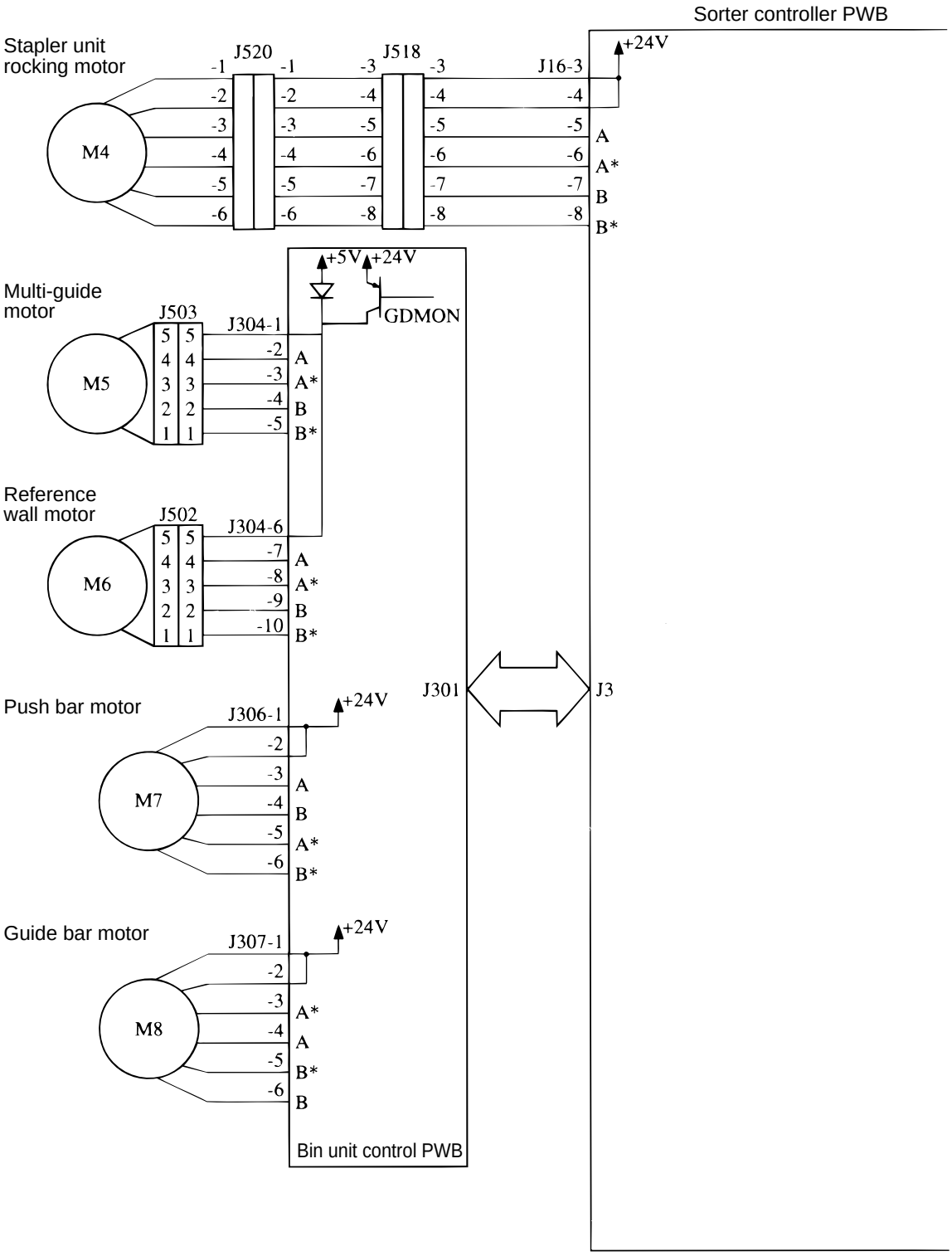


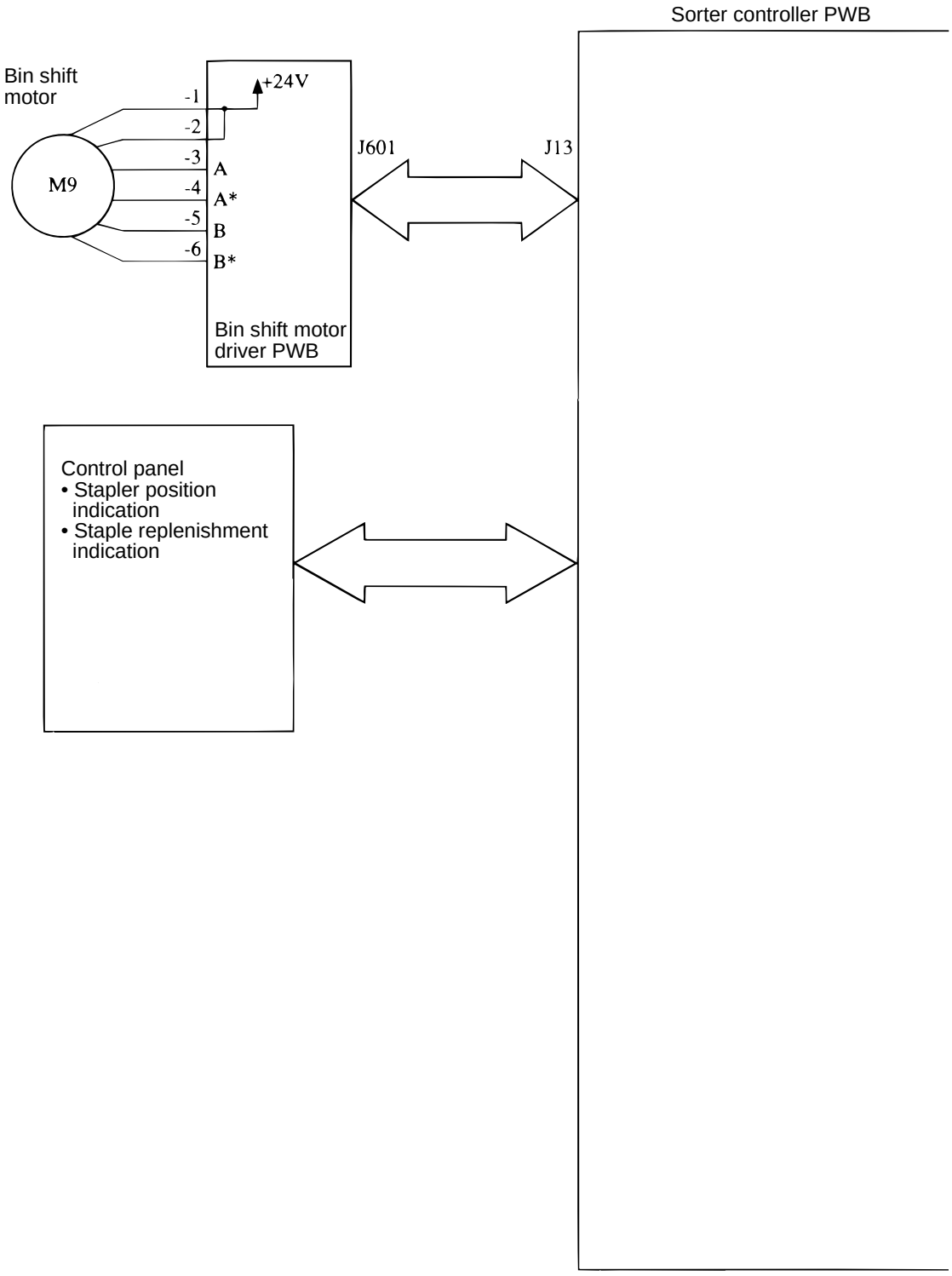
(4) Sorter controller input (4/4)



D. Solenoid motor drive circuit




Sorter controller PWB
Stapler unit rocking motor
J520
J518
J16-3
+24V
M4
A
A*
B
B*
+5V
+24V
GDMON
Multi-guide motor
J503
J304-1
M5
Reference wall motor
J502
J304-6
M6
J301
J3
Push bar motor
J306-1
M7
Guide bar motor
J307-1
M8
Bin unit control PWB

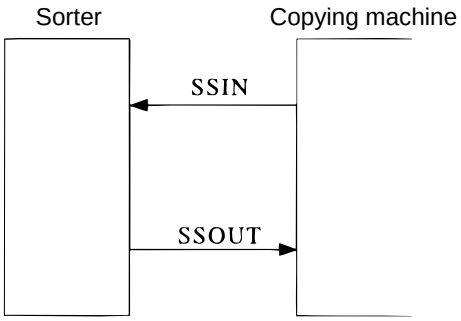

Sorter controller PWB
Bin shift motor
M9
-1
-2
-3
-4
-5
-6
+24V
A
A*
B
B*
J601
J13
Bin shift motor driver PWB
Control panel
• Stapler position indication
• Staple replenishment indication

E. Interface circuit

The copying machine and the sorter communicate with each other by sending the status signals through IPC (IC for communication).

These signals are once written in RAM provided on the sorter controller PWB and output according to the control signal sent from the CPU (Q1).

If signal transmission failure occurs, the self-diagnosing function of copying machine functions and displays the pertinent error code on the control panel even when the serviceman cannot check whether the status signals are sent normally.



SSIN : Signal which is sent from copying machine to sorter

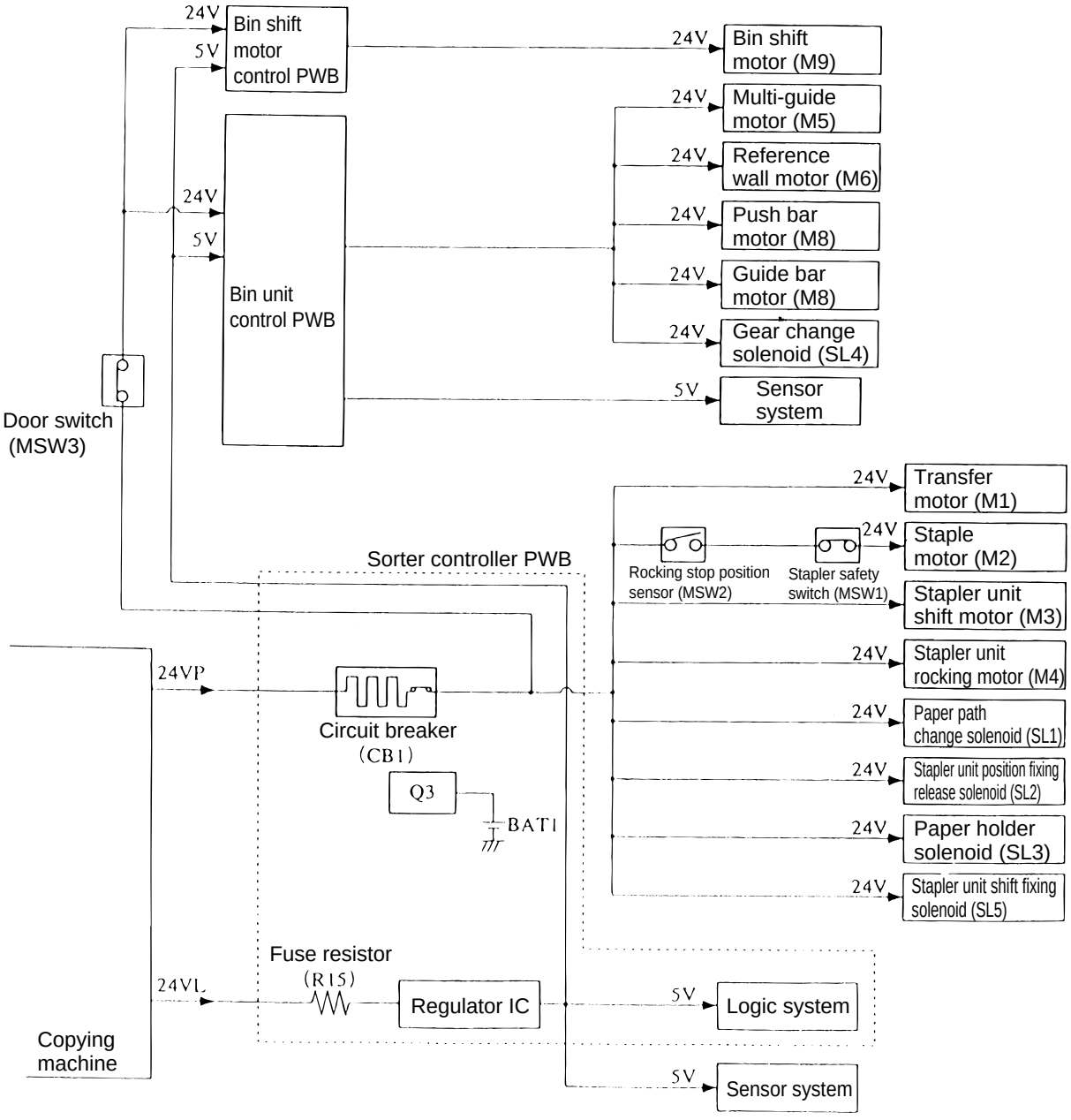
SSOUT : Signal which is sent from sorter to copying machine

F. Power supply

The power supply route is shown below.

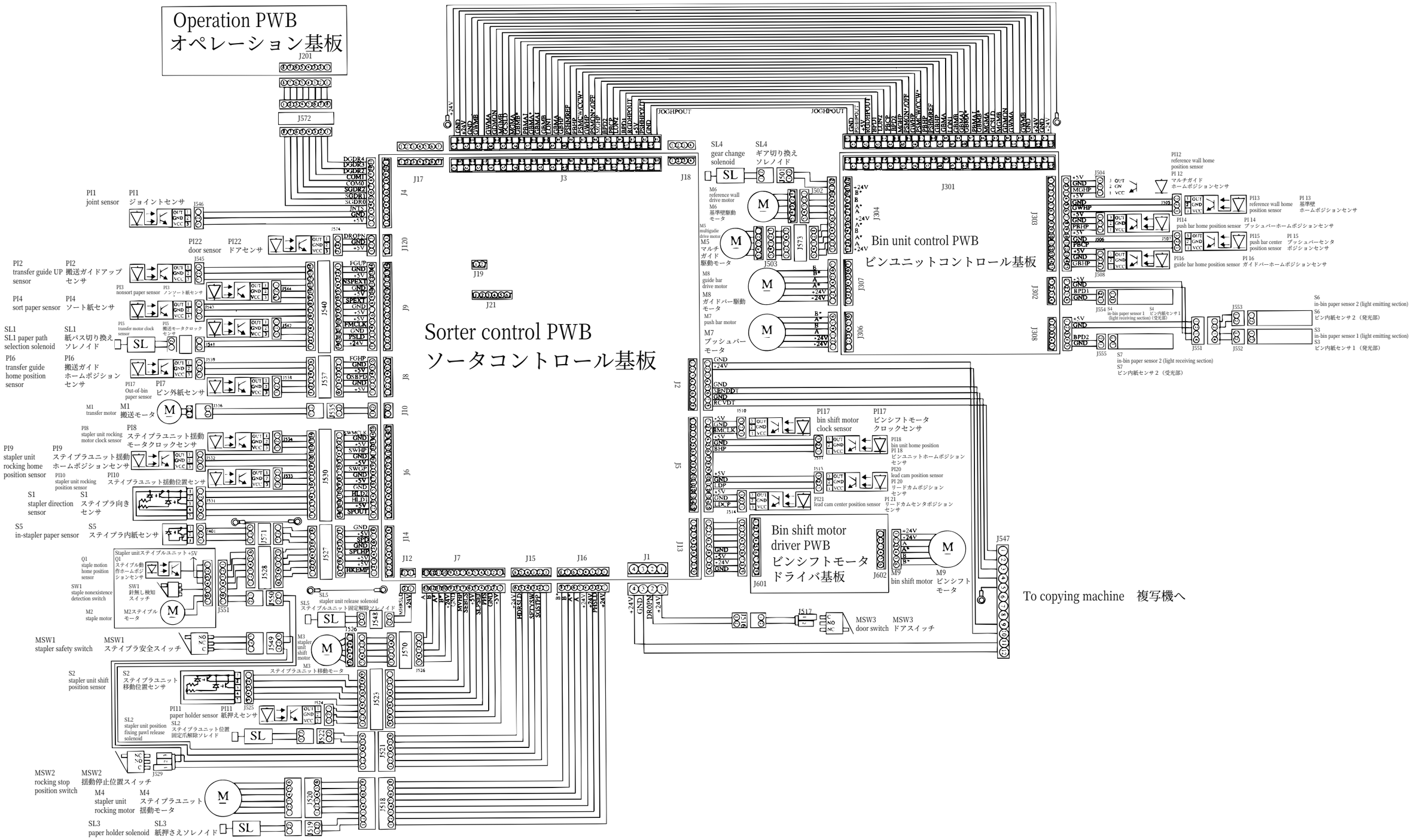
Power for the sorter is supplied from the copying machine. Power supply for the logic system (5V) is given from the 24V power source. It is controlled by the regulator IC provided on the sorter controller PWB.

When the power supply for the copying machine is turned off, the power supply for the sorter is also turned off. Therefore the sorter is provided with lithium battery (BAT1) on the sorter controller PWB so as to back up the RAM (Q3) provided on the sorter controller PWB.



〔10〕回路図　CIRCUIT DIAGRAM

1．ブロック図（実体配線図）　Block diagram (wiring diagram)



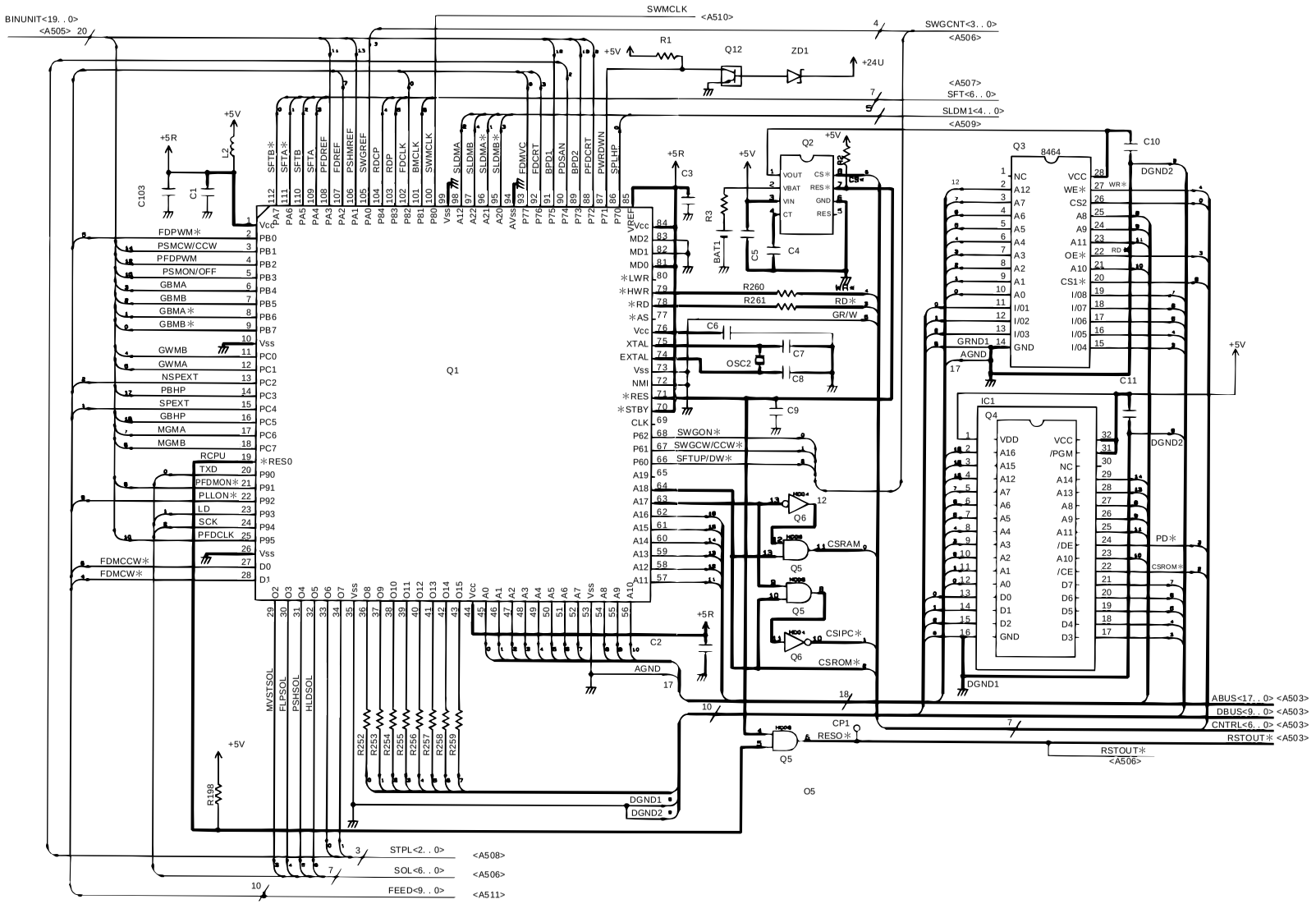
2．Sorter control PWB

Sorter control PWB（1）

2．ソータコントロール基板

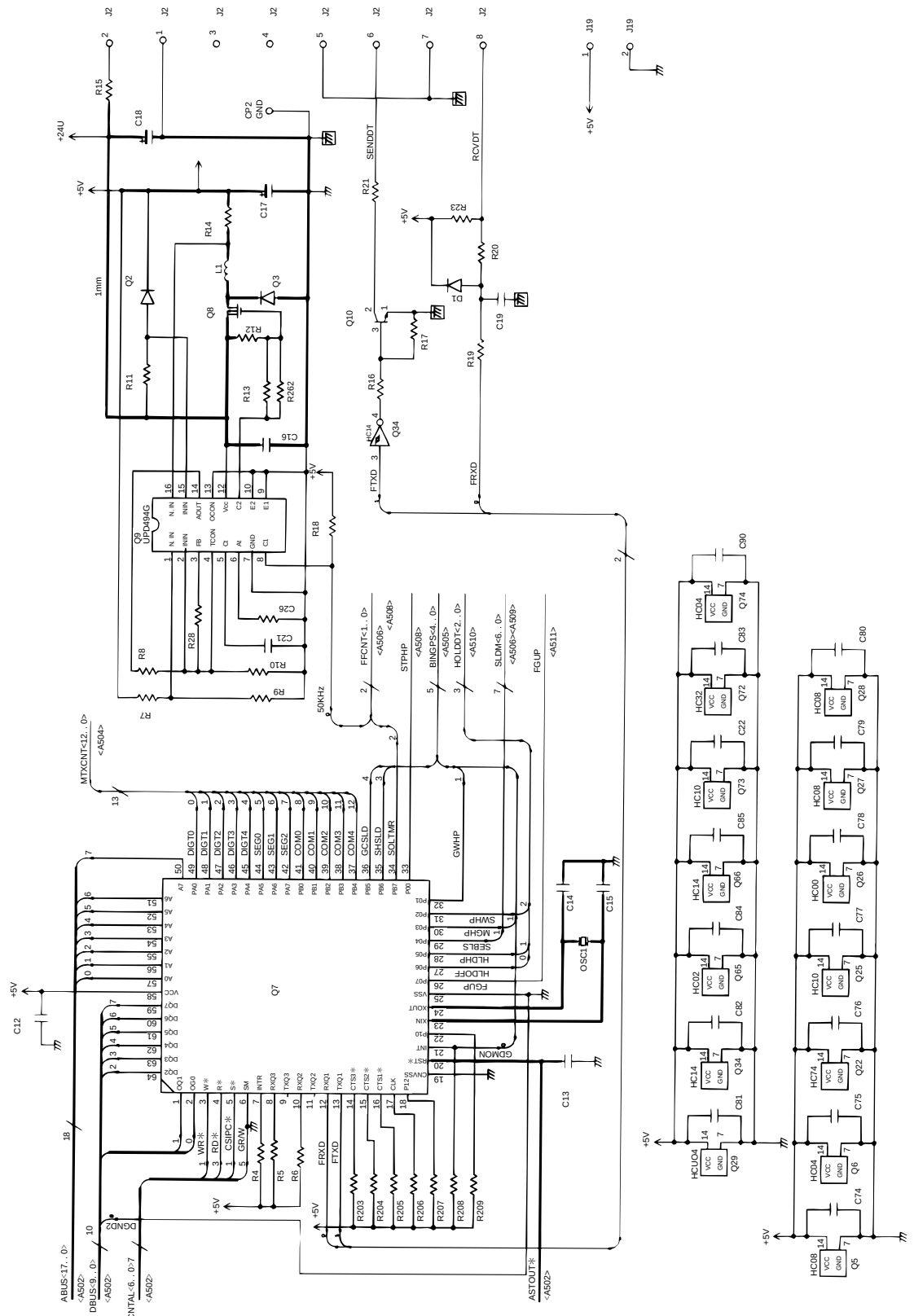
ソータコントロール基板（1）

＜A502＞



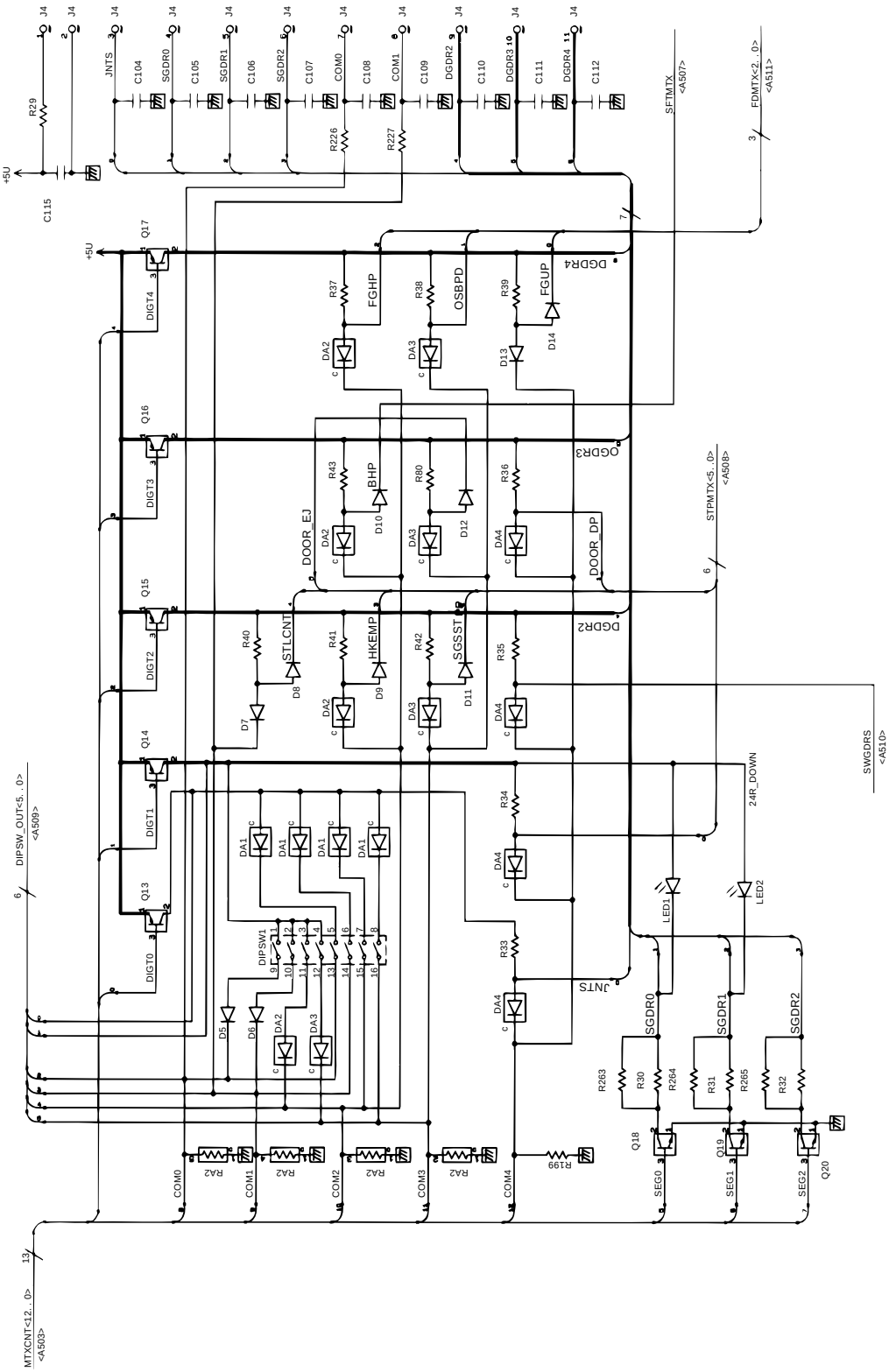
Sorter control PWB（2）　ソータコントロール基板（2）

<A503>



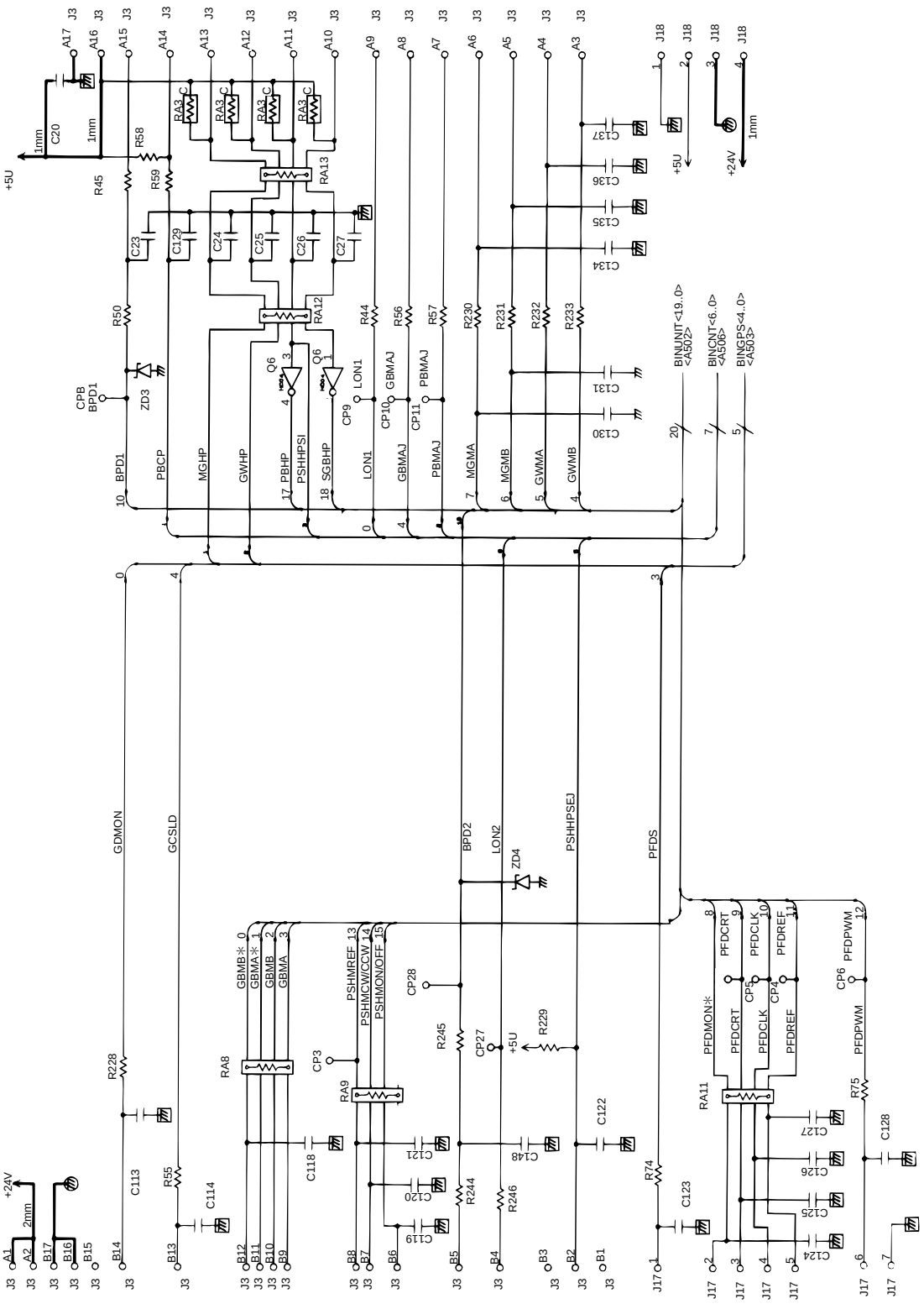
Sorter control PWB（3）　ソータコントロール基板（3）

<A504>



Sorter control PWB（4）　ソータコントロール基板（4）

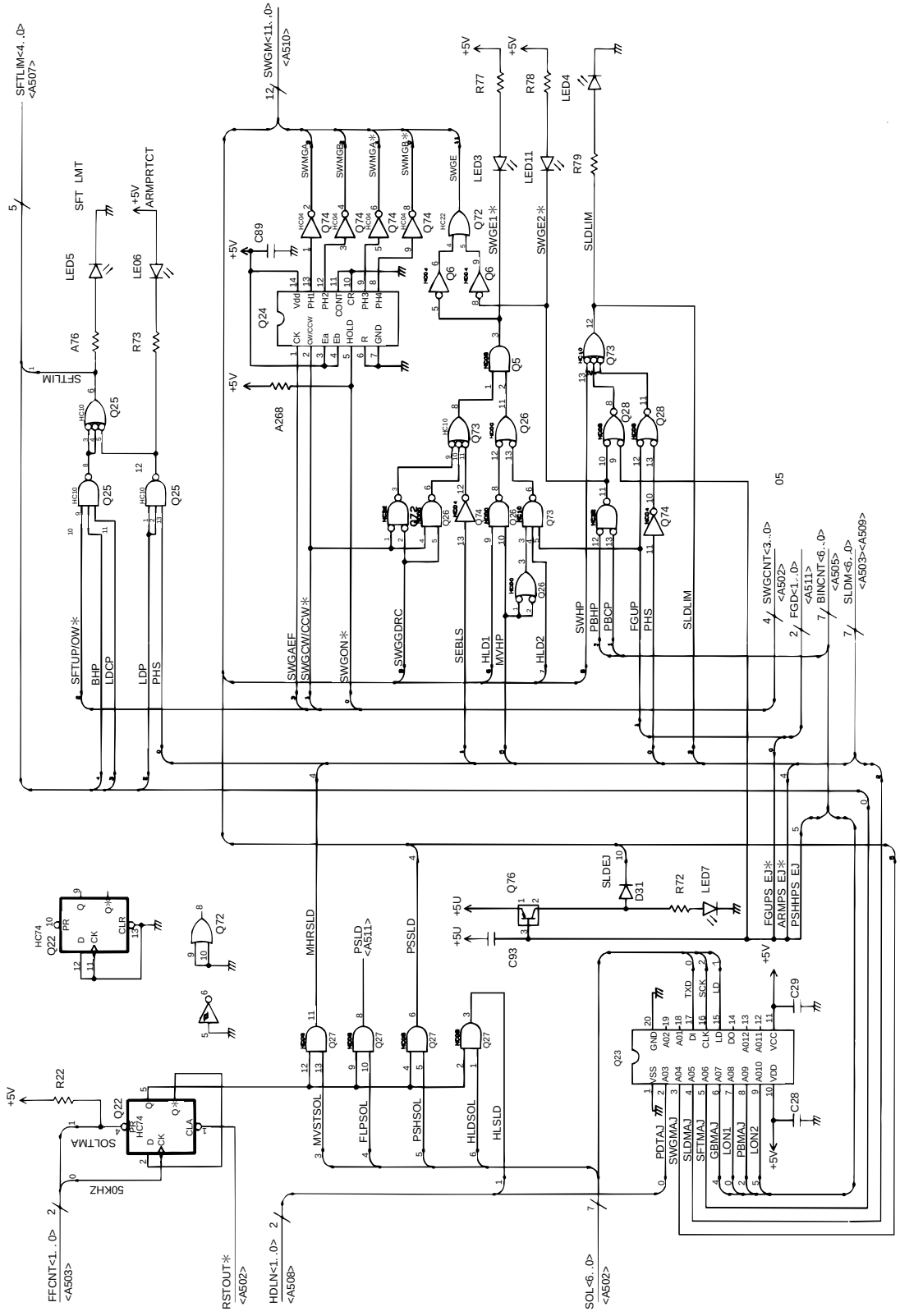
<A505>



Sorter control PWB (5)

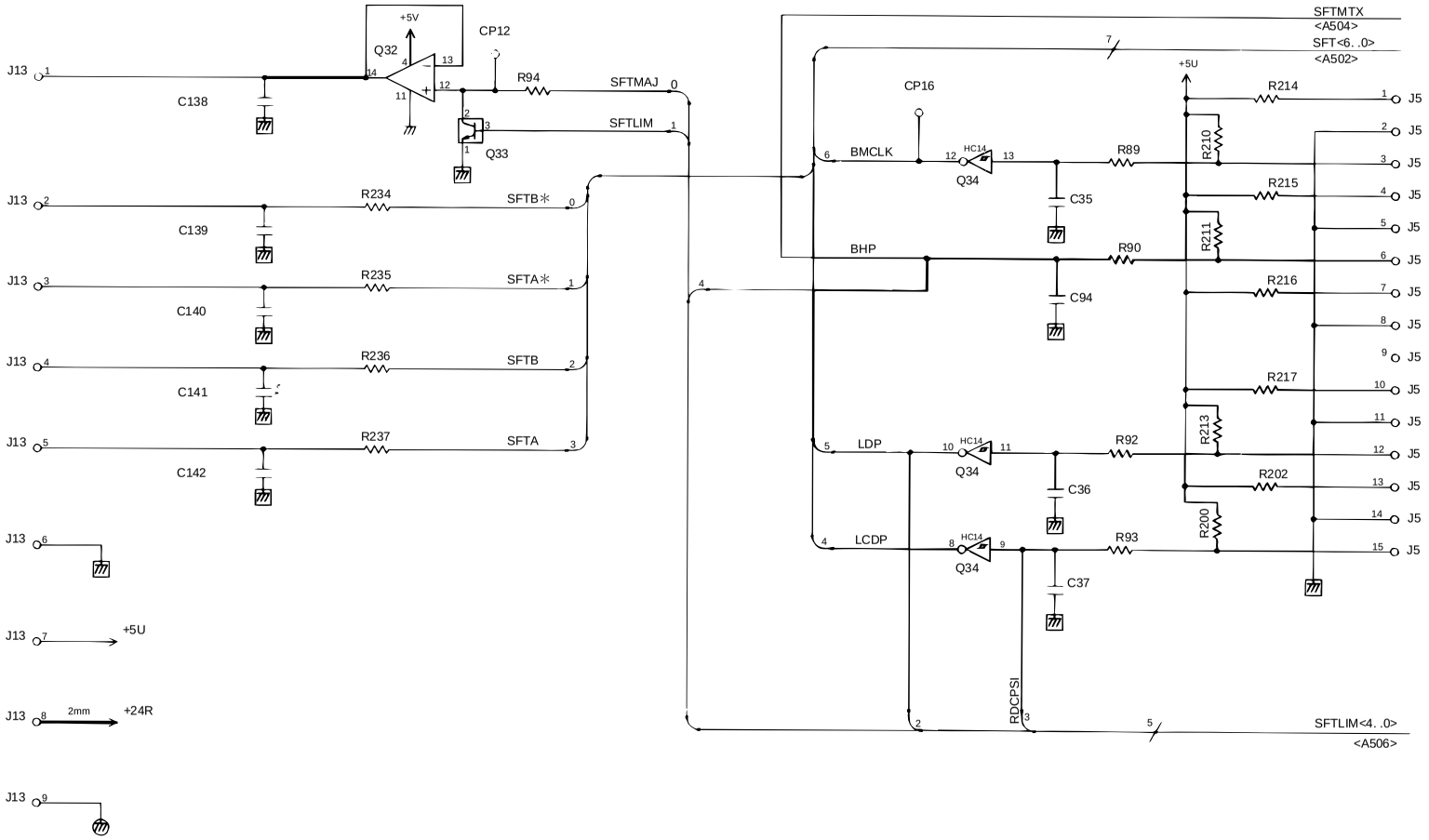
ソータコントロール基板（5）

<A506>



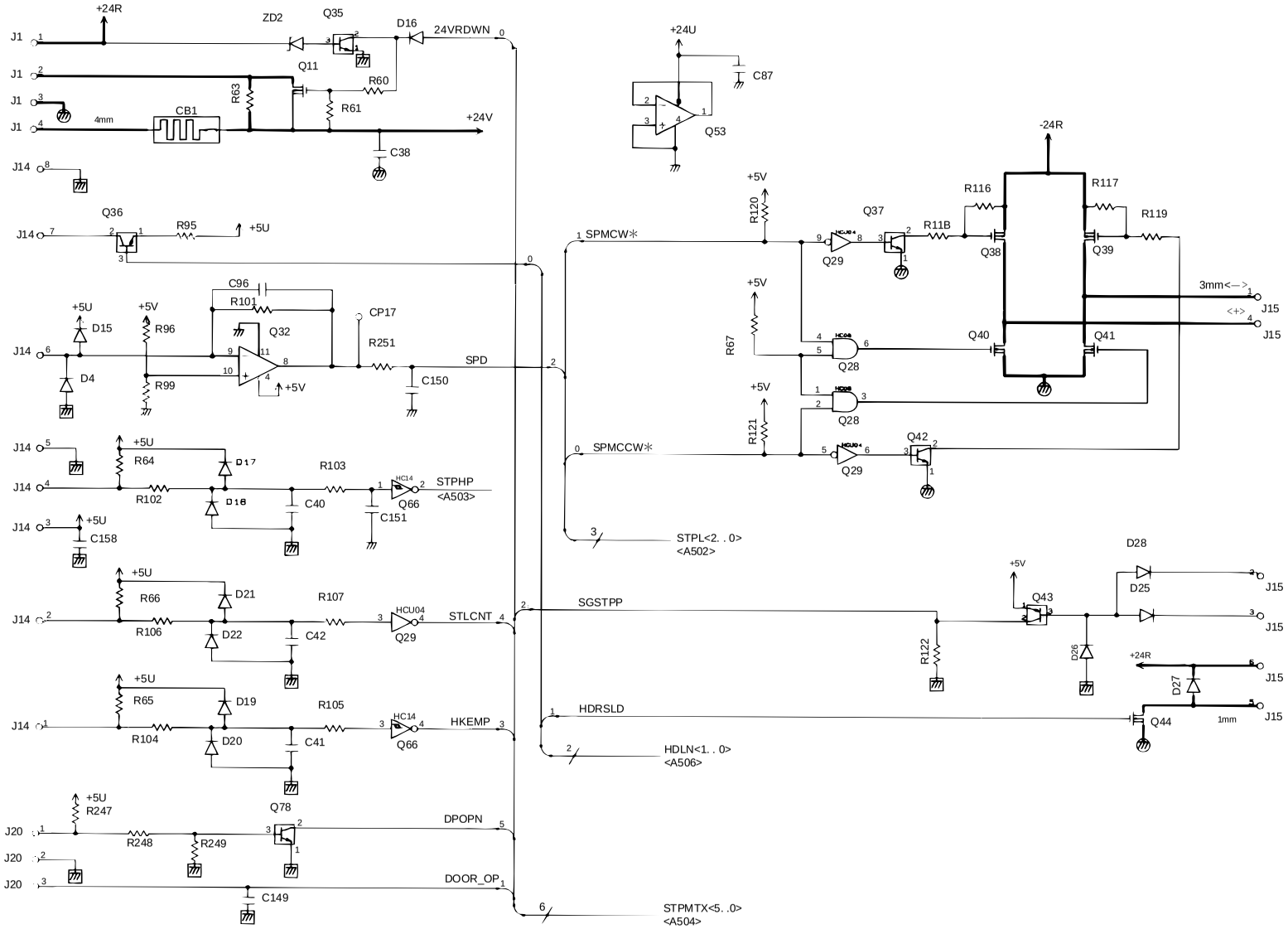
Sorter control PWB（6）　　ソータコントロール基板（6）

＜A507＞



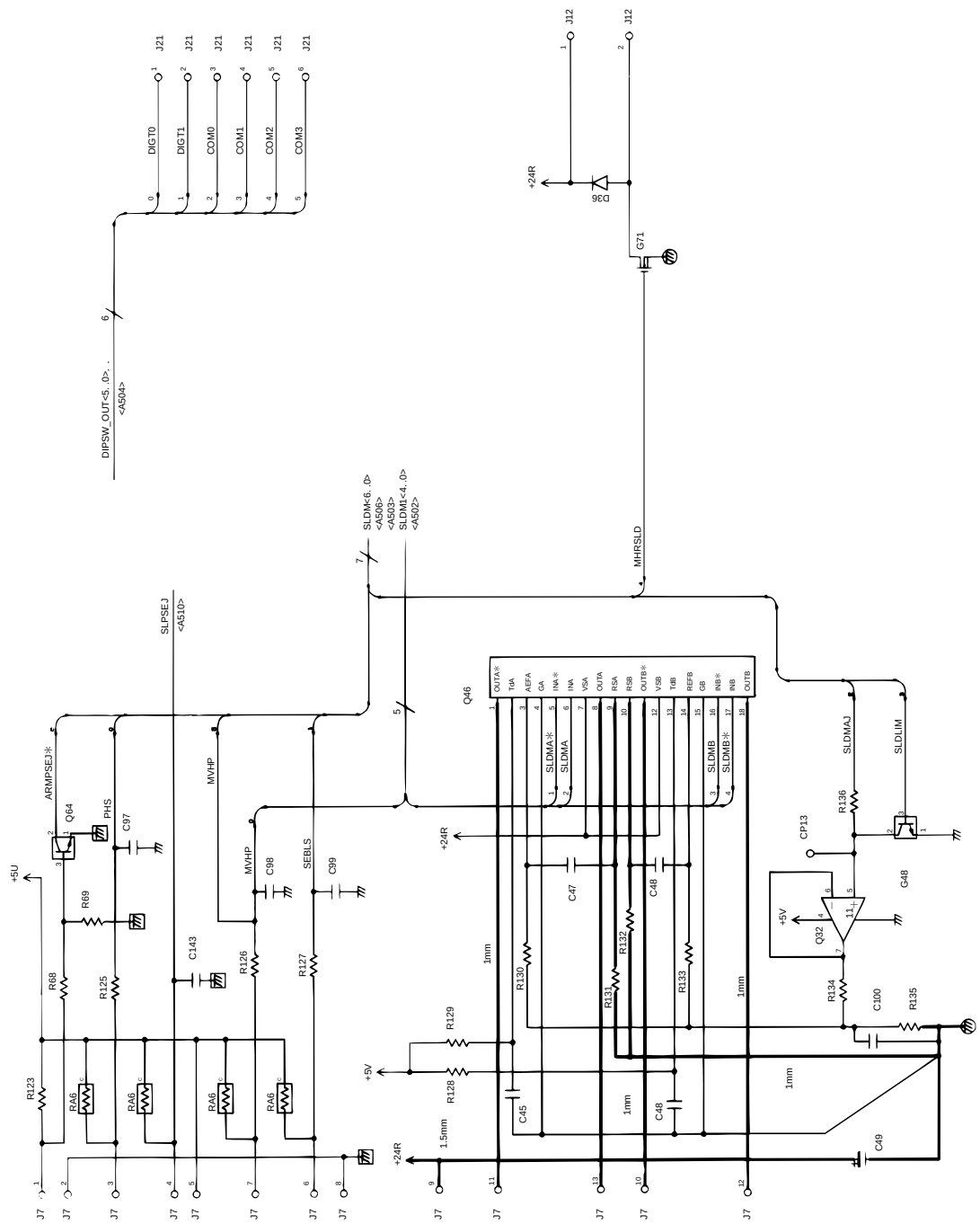
Sorter control PWB（7）　　ソータコントロール基板（7）

＜A508＞



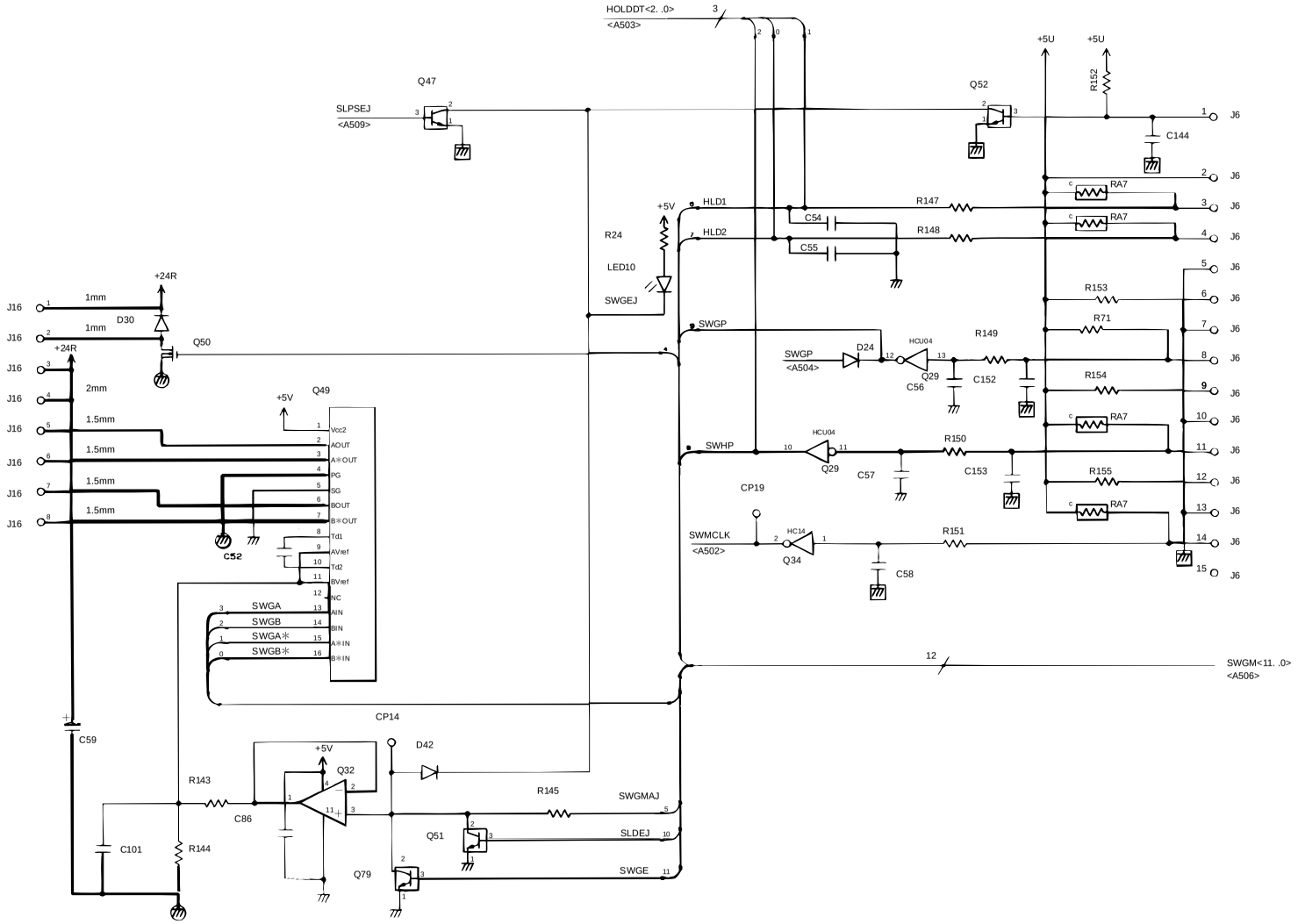
Sorter control PWB（8）　ソータコントロール基板（8）

<A509>



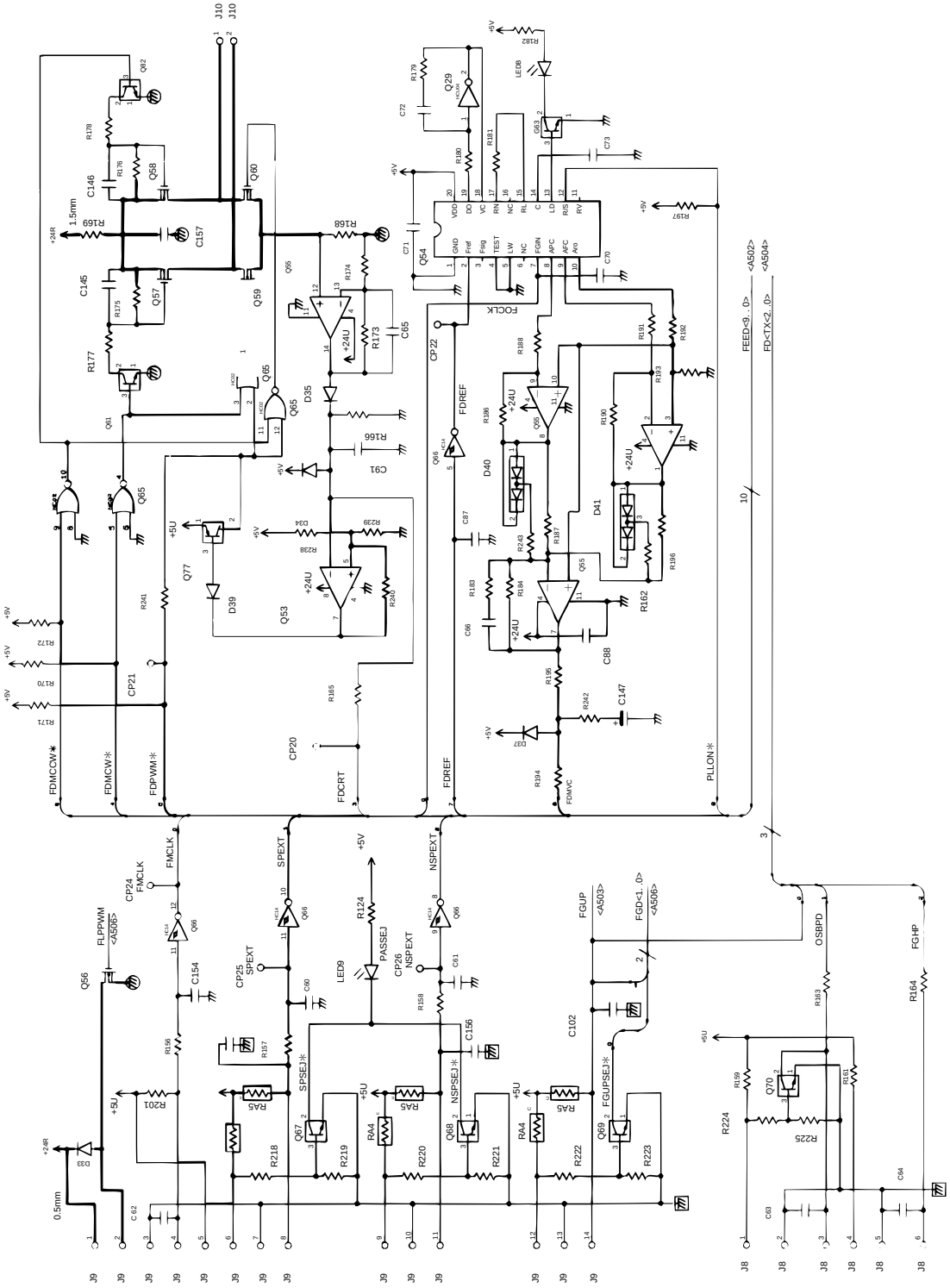
Sorter control PWB（9）　　ソータコントロール基板（9）

＜A510＞



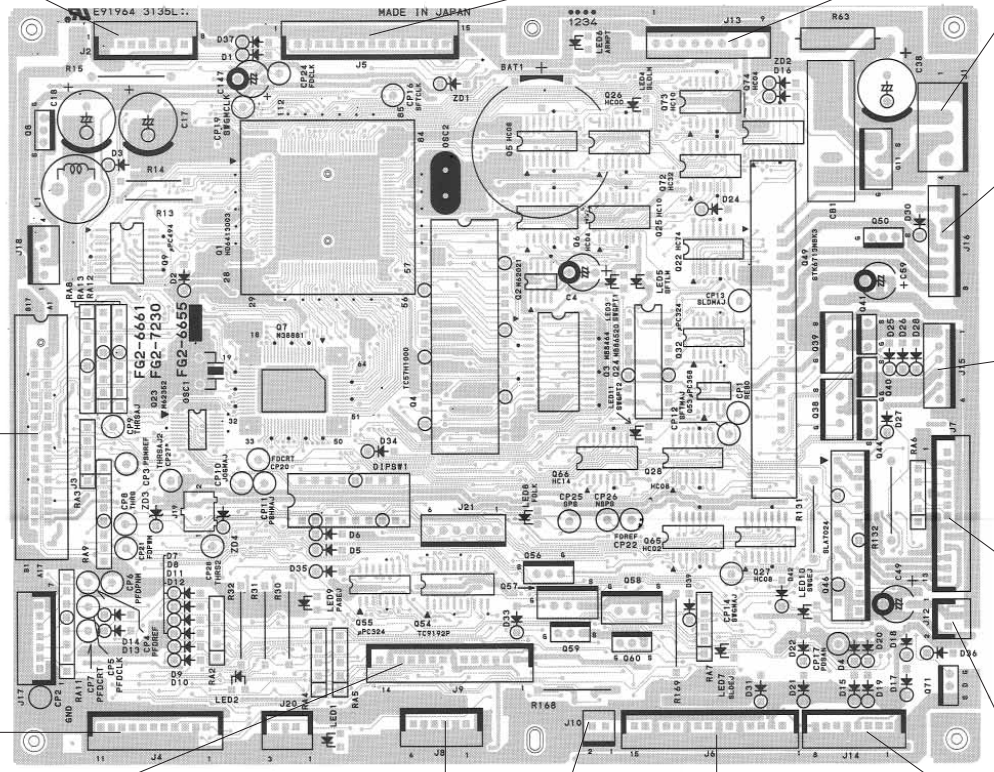
Sorter control PWB (10)　ソータコントロール基板 (10)

<A511>



Sorter control PWB
Parts layout（surface）

ソータコントロール基板
部品配置図（表面）



1	GND	Copying machine 複写機本体
2	+24V	
3		
4		
5	GND	Copying machine 複写機本体
6	SENDDT	
7	GND	
8	RCVDT	

1	+5V	Bin shift motor clock sensor ビンシフトモータークロックセンサー
2	GND	
3	BMCLK	
4	+5V	Bin unit home position sensor ビンユニットホームポジションセンサー
5	GND	
6	BHP	
7		
8		
9		
10	+5V	Lead cam position sensor リードカムポジションセンサー
11	GND	
12	LDP	
13	+5V	Lead cam center position sensor リードカムセンターポジションセンサー
14	GND	
15	LDCP	

1	SFTMAJ	Bin shift motor drive PWB ビンシフトモータードライブ基板
2	SFTB＊	
3	SFTA＊	
4	SFTB	
5	SFTA	
6	GND	
7	+5V	
8	+24V	
9	GND	

1	+24V	Door switch ドアスイッチ
2	DROPN	
3	GND	Copying machine 複写機本体
4	+24V	

1	+24V	Paper holder solenoid 紙押さえソレノイド
2	PHSLD	
3	+24V	Stapler unit drive motor ステイプラーユニット駆動モーター
4	+24V	
5	A	
6	A＊	
7	B	
8	B＊	

1		Rocking stop position switch 揺動停止位置スイッチ
2	SGSTPP	
3	SETYSW	Stapler safety swich ステイプラー安全スイッチ
4		
5	HORSLD	Stapler unit position fixing pawl release solenoid ステイプラーユニット位置固定爪解除ソレノイド
6	+24V	

1	+5V	Paper hoider sensor 紙押さえセンサー
2	GND	
3	PHS	
4	SLPSEJ	Stapler unit rocking position sensor ステイプラーユニット揺動位置センサー
5	+5V	
6	SEBLS	
7	MVHP	
8	GND	
9	+24V	Staple unit shift motor ステイプラーユニット移動モーター
10	B＊	
11	A＊	
12	B	
13	A	

1	+24V	Staple unit fixing solenoid ステイプルユニット固定解除ソレノイド
2	MHRSLD	

1	HKEMP	Staple unit ステイプルユニット
2	+5V	
3	+5V	
4	SPLHP	
5	GND	
6	SPD	Stapler built-in sensor ステイプラー内臓センサー
7	+5V	
8	GND	

A1	+24V	JOGHPUOT
A2	+24V	PSHHPOUT
A3	GWMB	RGDHPOUT
A4	GEMA	LON2
A5	MWMB	BPD2
A6	MWMA	PSMON＊/OFF
A7	PBMAJ	PSMCW/CCW＊
A8	GBMAJ	PSHMREF
A9	LON1	GBMA
A10	GBHP	GBMB
A11	PRHP	GBMA＊
A12	GWHP	GBMB＊
A13	MGHP	GCSLD
A14	PBCP	GDMON
A15	RPD1	
A16	+5V	GND
A17	GND	GND

Bin unit control PWB ビンユニットコントロール基板

B1	JOGHPUOT	
B2	PSHHPOUT	
B3	RGDHPOUT	
B4	LON2	
B5	BPD2	
B6	PSMON＊/OFF	
B7	PSMCW/CCW＊	
B8	PSHMREF	
B9	GBMA	
B10	GBMB	
B11	GBMA＊	
B12	GBMB＊	
B13	GCSLD	
B14	GDMON	
B15		
B16	GND	
B17	GND	

Bin unit control PWB ビンユニットコントロール基板

1	+5V	Joint sensor ジョイントセンサー
2	GND	
3	JNTS	
4	SGDR0	Operation PWB オペレーション基板
5	SGDR1	
6	SGDR2	
7	COM0	
8	COM1	
9	DGDR2	
10	DGDR3	
11	DGDR4	

1	+24V	Paper path selection solenoid 紙パス切換えソレノイド
2	PSLD	
3	GND	Transfer motor clock sensor 搬送モータークロックセンサー
4	FMCLK	
5	+5V	
6	+5V	Sort paper sensor ソート紙センサー
7	GND	
8	SPEXT	
9	+5V	Nonsort paper sensor ノンソート紙センサー
10	GND	
11	NSPEXT	
12	+5V	Transfer guide up sensor 搬送ガイドアップセンサー
13	GND	
14	PGUP	

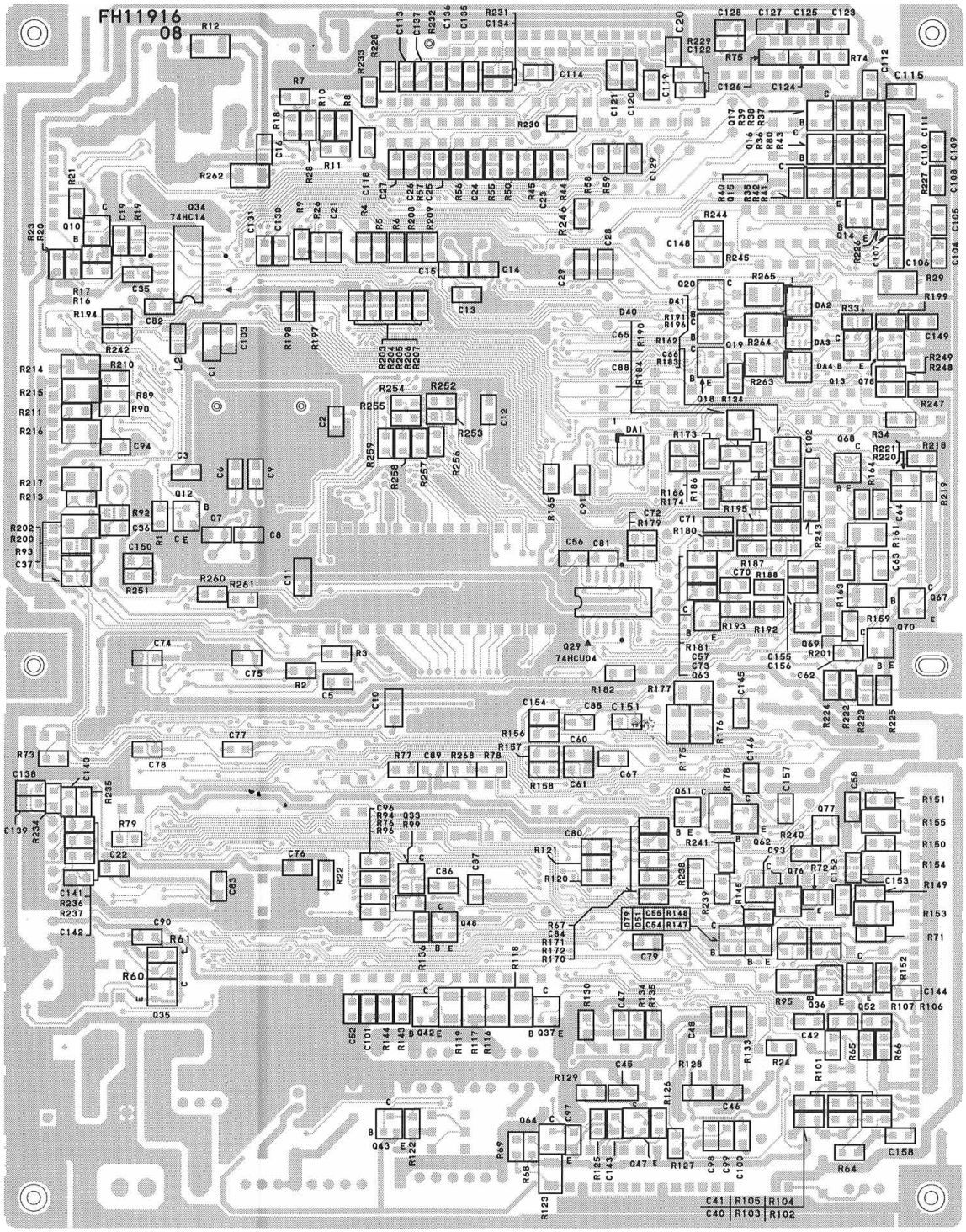
1	+5V	Out-of-bin paper sensor ビン外紙センサー
2	GND	
3	OSBPD	
4	+5V	Transfer guide home position sensor 搬送ガイドホームポジションセンサー
5	GND	
6	PGHP	

1		Transfer motor 搬送モーター
2		

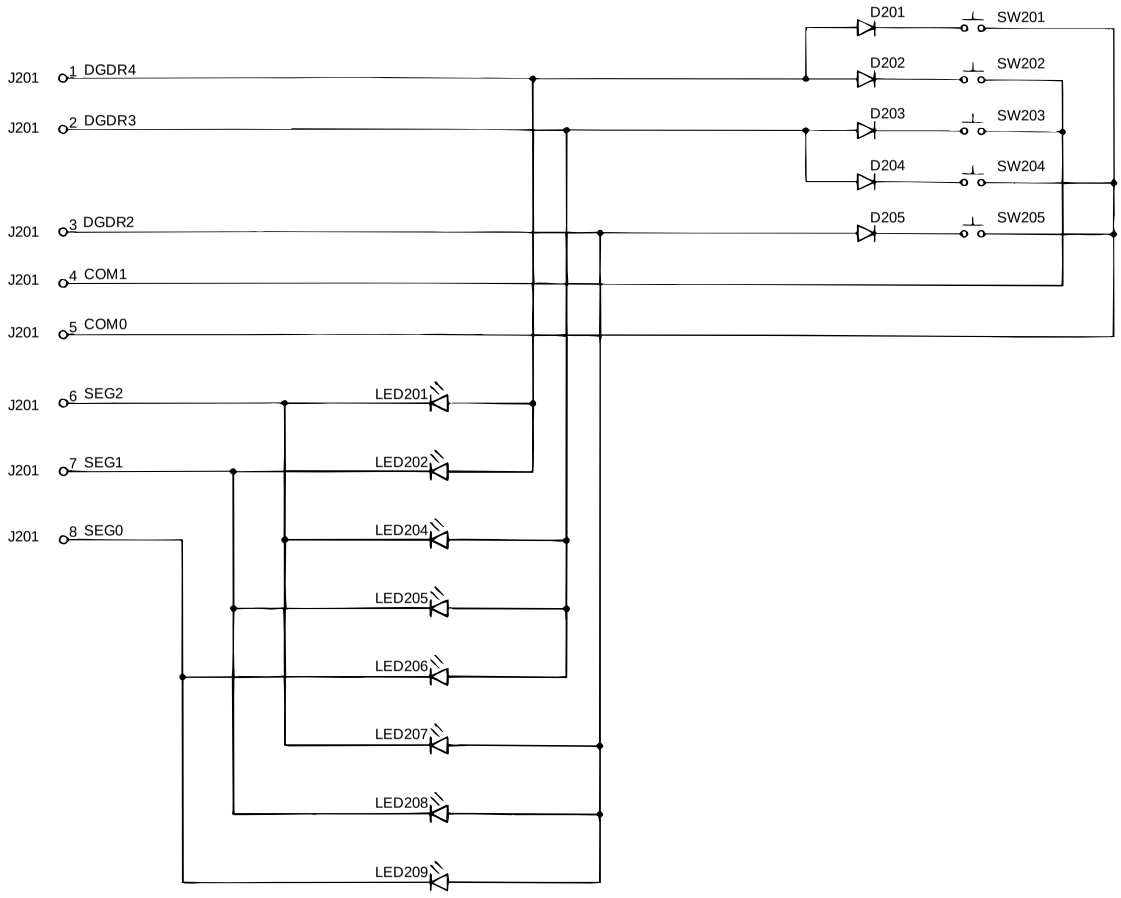
1	SPOUT	
2	+5V	Stapler direction sensor ステイプラー向きセンサー
3	HLD1	
4	HLD2	
5	GND	
6	+5V	Stapler rocking position sensor ステイプラー揺動位置センサー
7	GND	
8	SWGP	
9	+5V	Stapler unit rocking home position sensor ステイプラーユニット揺動ホームポジションセンサー
10	GND	
11	SWHP	
12	+5V	Stapler unit rocking motor clock sensor ステイプラーユニット揺動モータークロックセンサー
13	GND	
14	SWMCLK	
15		

Sorter control PWB
Parts layout (back)

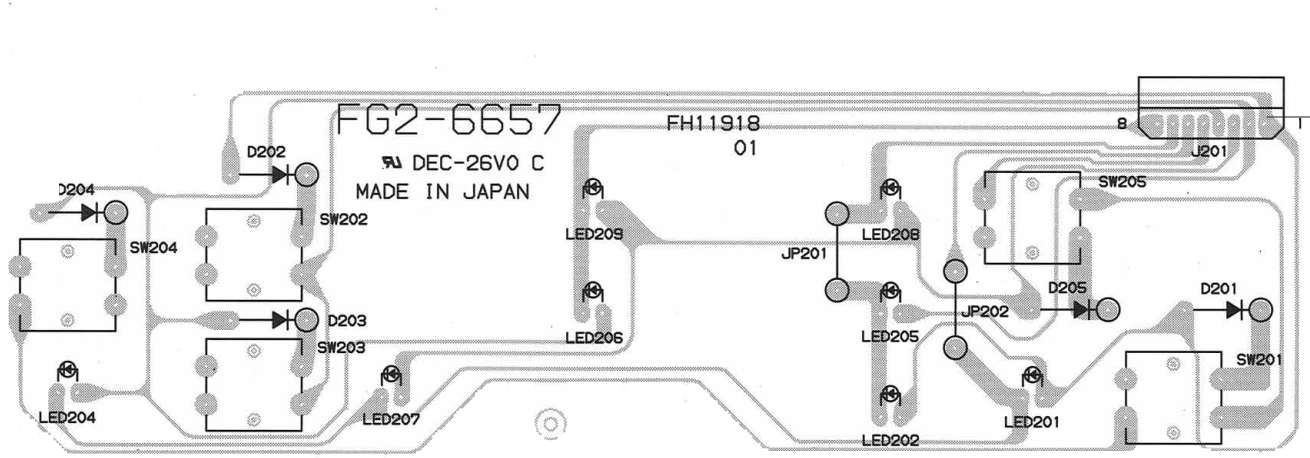
ソータコントロール基板
部品配置図（裏面）



3．Operasion PWB　　3．オペレーション基板



Operation PWB（Parts layout）　　オペレーション基板（部品配置図）



1	DGDR4	ソーター コントロール基板
2	DGDR3	
3	DGDR2	
4	COM1	
5	COM2	
6	SGDR2	
7	SGDR1	
8	SGDR0	

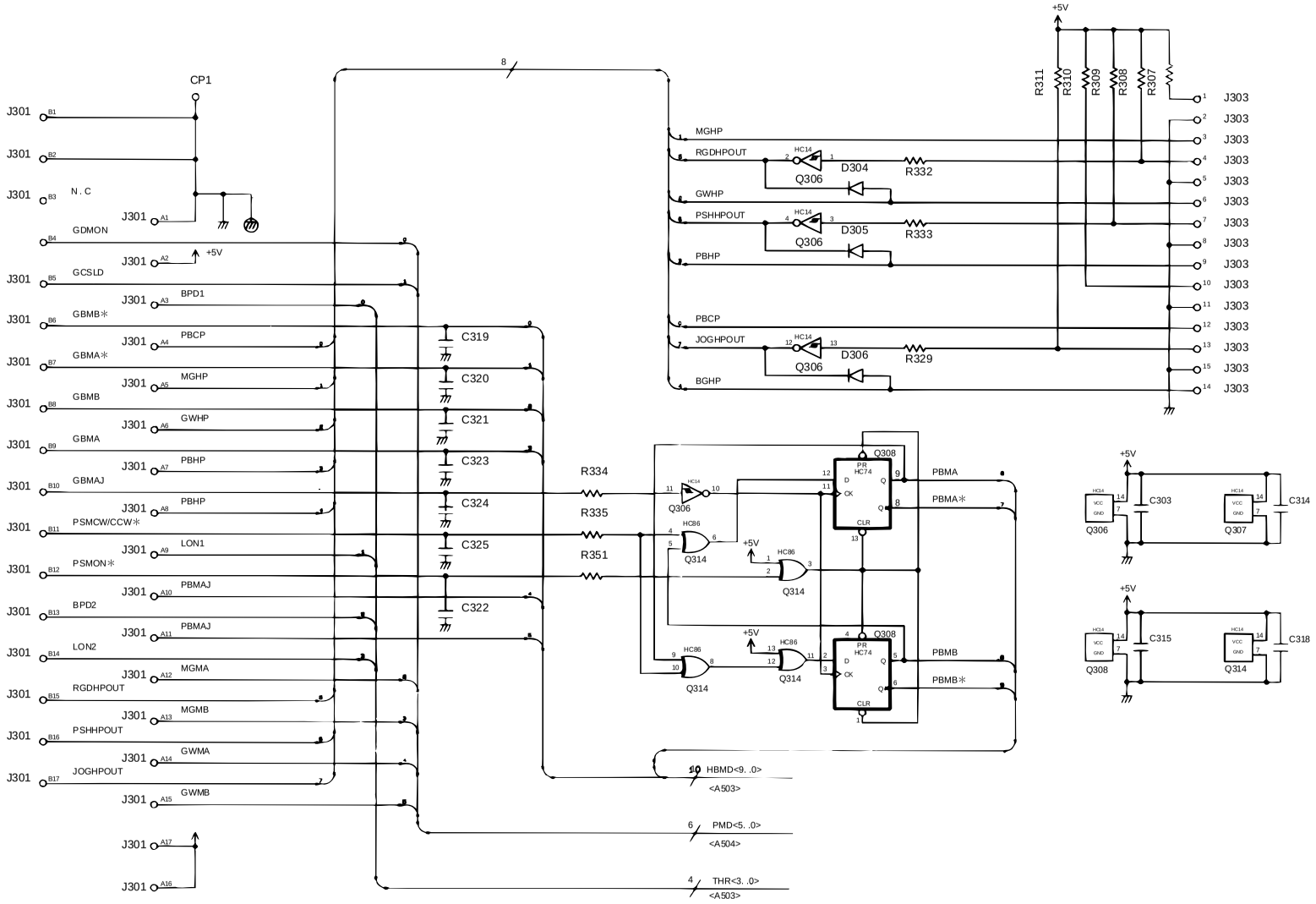
4．Bin unit control PWB

Bin unit control PWB（1）

4．ビンユニットコントロール基板

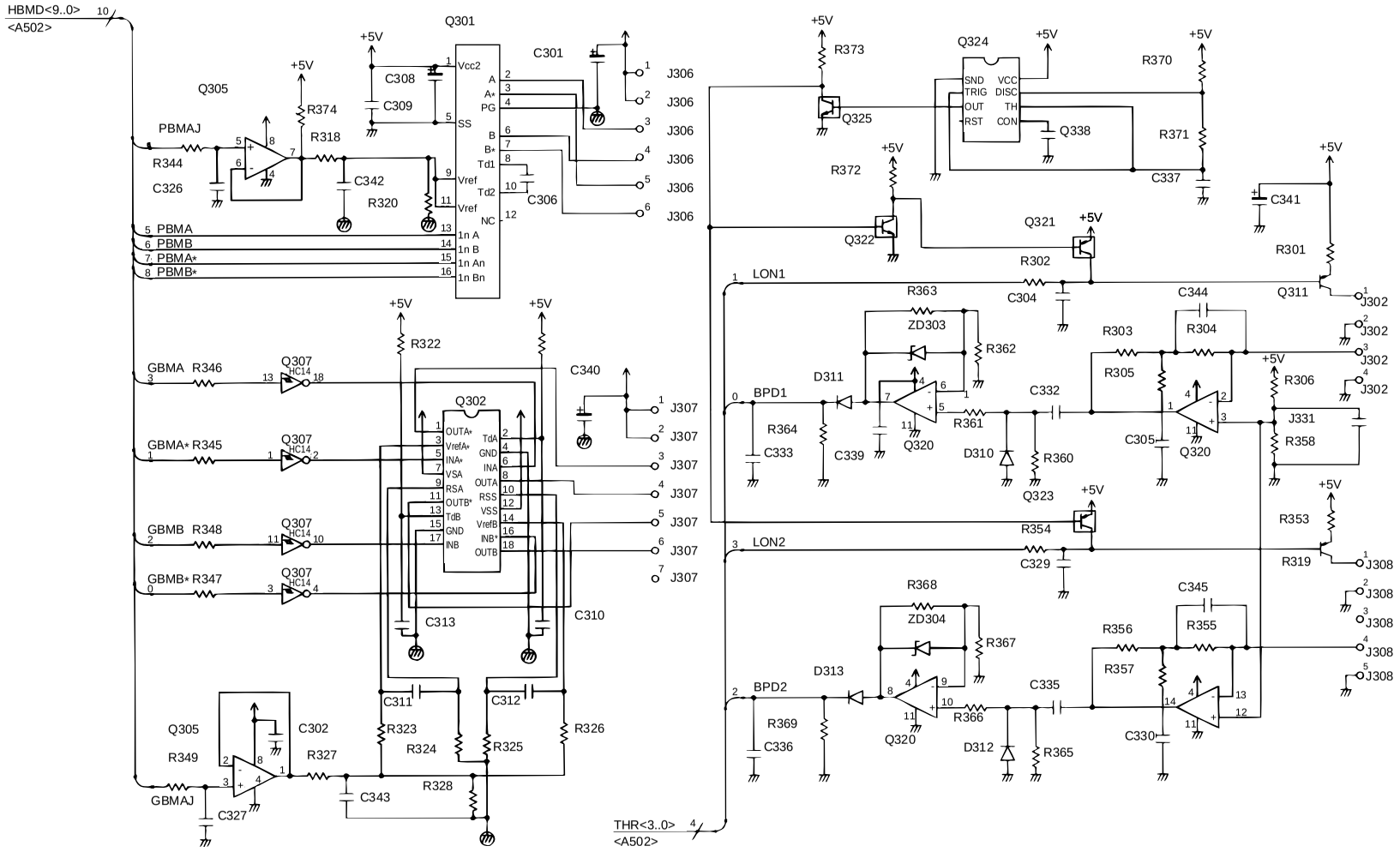
ビンユニットコントロール基板（1）

＜A502＞



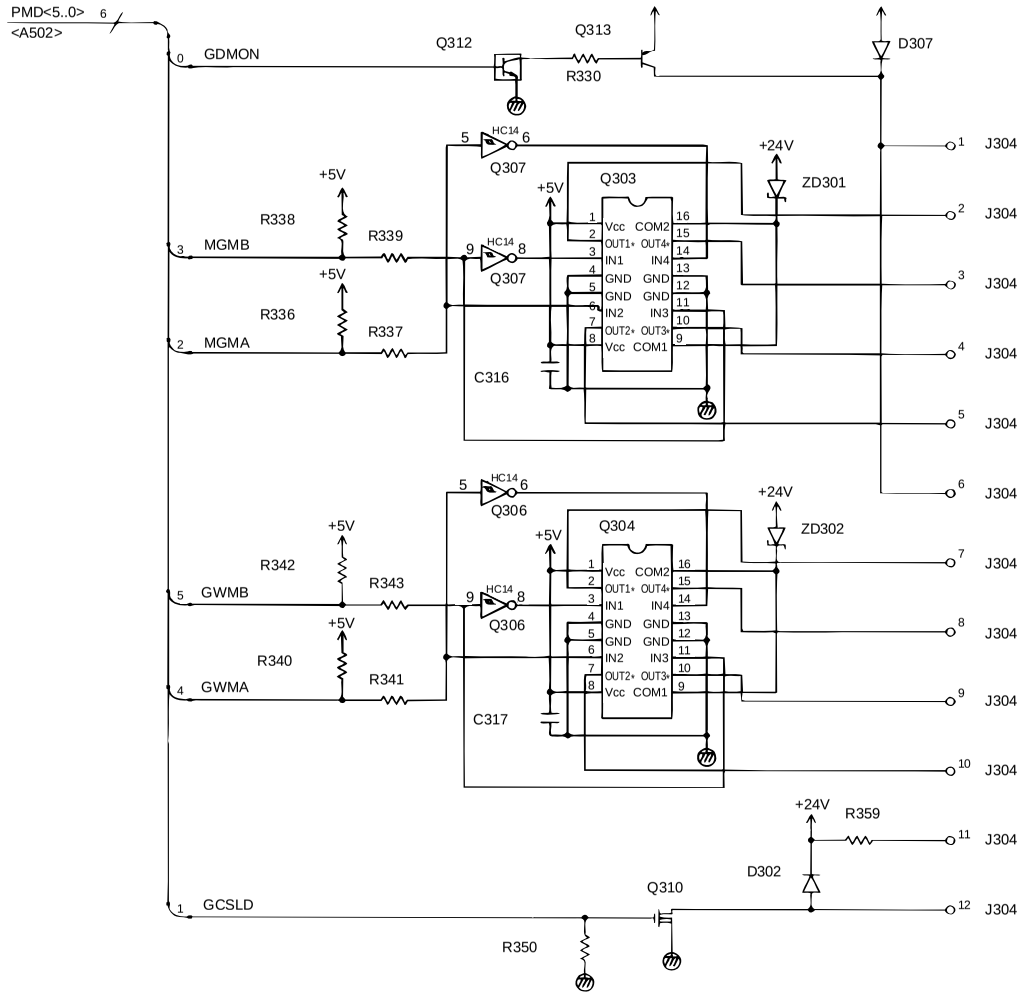
Bin unit control PWB（2）　　ビンユニットコントロール基板（2）

＜A503＞



Bin unit control PWB（3）　　ビンユニットコントロール基板（3）

＜A504＞



Bin unit control PWB

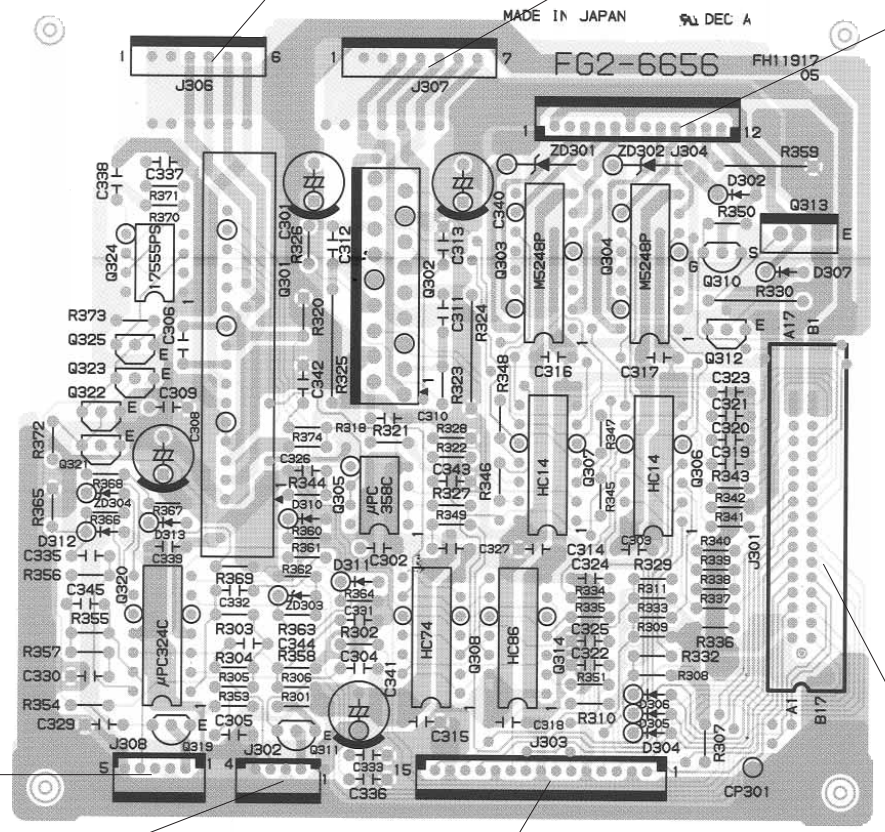
（Parts layout）

ビンユニットコントロール基板
（部品配置図）

1	+24V	Push bar motor プッシュバーモーター
2	+24V	
3	A＊	
4	A	
5	B＊	
6	B	

1	+24V	Guide bar drive motor ガイドバー駆動モーター
2	+24V	
3	A＊	
4	A	
5	B＊	
6	B	
7		

1	+24V	Multiguide drive motor マルチガイド駆動モーター
2	A	
3	A＊	
4	B	
5	B＊	
6	+24V	Reference wall drive motor 基準壁駆動モーター
7	A	
8	A＊	
9	B	
10	B＊	
11	+24V	Gear change solenoid ギア切換えソレノイド
12		



1	+5V	In-bin paper sensor 2 ビン内紙センサー2 (light emitting side) (発行側)
2	GND	
3		
4	BPD1	In-bin paper sensor 2 ビン内紙センサー2 (light receiving side) (受光側)
5	GND	

1	+5V	In-bin paper sensor 1 ビン内紙センサー1 (light emitting side) (発行側)
2	GND	
3	BPD1	In-bin paper sensor 1 ビン内紙センサー1 (light receiving side) (受光側)
4	GND	

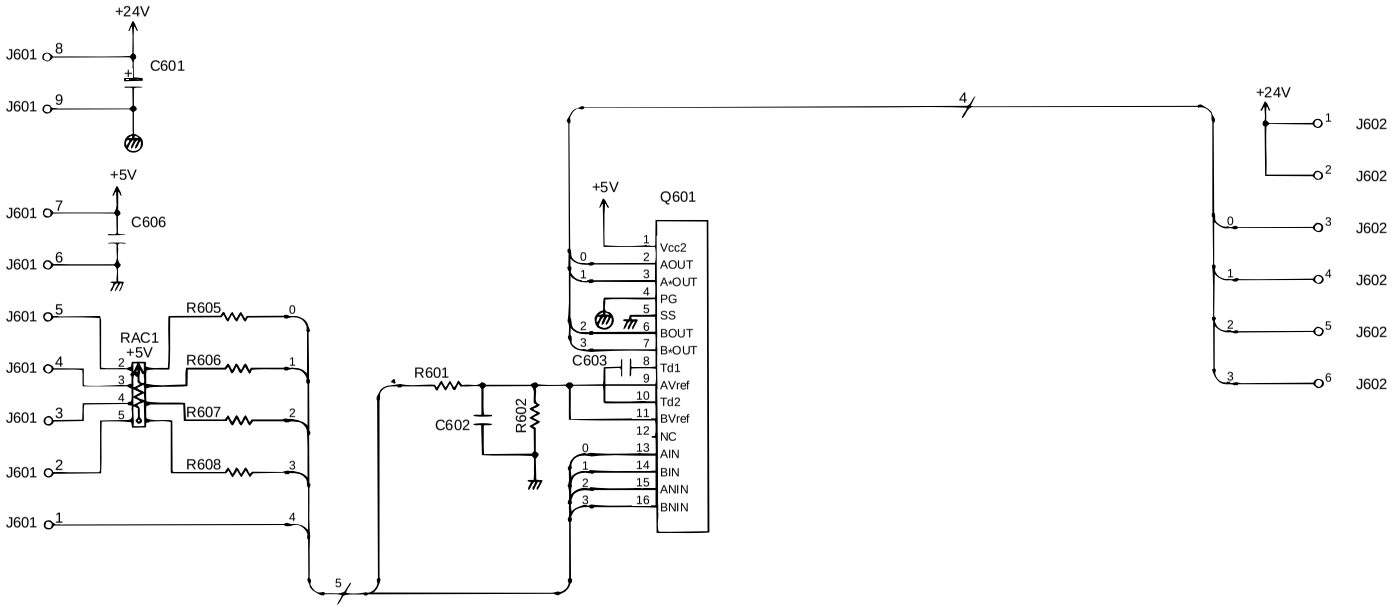
1	+5V	Multiguide home posicion sensor マルチガイド ホームポジション センサー
2	GND	
3	MGHP	
4	+5V	Reference wall home position sensor 基準壁 ホームポジション センサー
5	GND	
6	GWHP	
7	+5V	Push bar home position sensor プッシュバー ホームポジション センサー
8	GND	
9	PBHP	
10	+5V	Push bar home position sensor プッシュバー ホームポジション センサー
11	GND	
12	PBCP	
13	+5V	Guide bar home position sensor ガイドバー ホームポジション センサー
14	GND	
15	GBHP	

A1	GND	Sorter control PWB ソーター コントロール基板
A2	+5V	
A3	RPD1	
A4	PBCP	
A5	MGHP	
A6	GWHP	
A7	PRHP	
A8	GBHP	
A9	LON1	
A10	GBMAJ	
A11	PBMAJ	
A12	MWMA	
A13	MWMB	
A14	GWMA	
A15	GWMB	
A16	+24V	
A17	-24v	

B1	GND	Sorter control PWB ソーター コントロール基板
B2	GND	
B3		
B4	GDMON	
B5	GCSLD	
B6	GBMB＊	
B7	GBMA＊	
B8	GBMB	
B9	GBMA	
B10	PSHMREF	
B11	PSMCW/CCW＊	
B12	PSMON＊/OFF	
B13	BPD2	
B14	LON2	
B15	RGDHPOUT	
B16	PSHHPOUT	
B17	JOGHPUOT	

5．Bin shift motor driver PWB

5．ビンシフトモータードライバ基板



Bin shift motor driver PWB

(Parts layout)

ビンシフトモータードライバー基板

(部品配置図)